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AAES/TA-7C CONTROL AND DISPLAY INTERFACE.(U)

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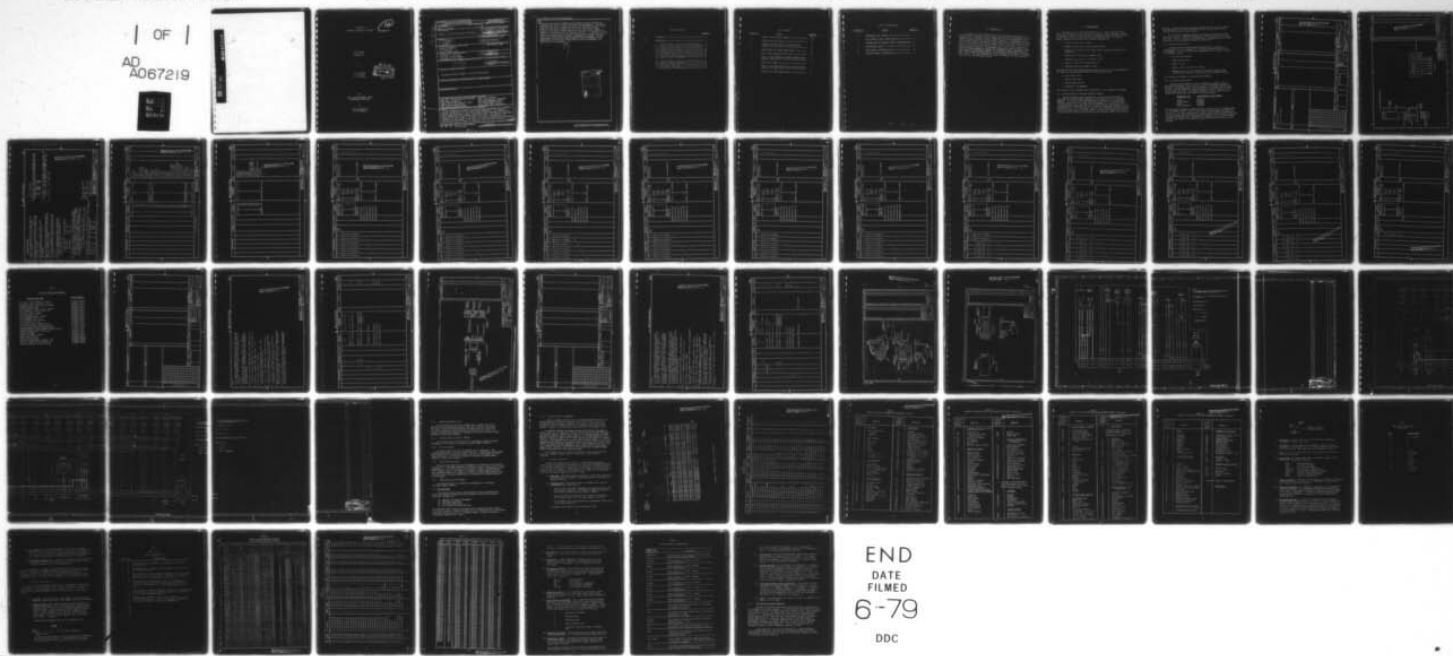
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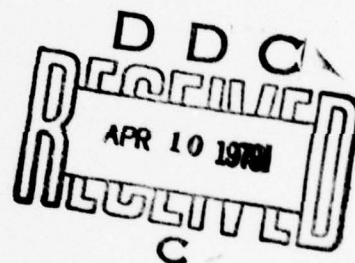
AAES/TA-7C
CONTROL AND DISPLAY INTERFACE

12

FINAL REPORT
OCTOBER 1978

by

J. R. Perkins
A. J. Marek
D. E. Lautner



For

NAVAL AIR DEVELOPMENT CENTER
DEPARTMENT OF THE NAVY

by

VOUGHT CORPORATION
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1. REPORT NUMBER NADC-77326-60	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) AAES (Adv. Aircraft Electrical System) AAES TA-7C Simulator HVDC (High Voltage DC) Power Conditioning & Conversion SOSTEL (Solid State Electric Logic) LMC (Load Management Center) AMUX (Avionic Multiplexing) Solid State Signal Source PGS (Power Generation System) Solid State Power Controllers		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This program was conducted for establishing requirements and developing specific design data for a hot bench mockup (simulator). The simulator system being developed is based on the AAES Prototype Design evolved by the Vought Corporation under contract N62269-75-C-0391. The simulator system will ultimately be used by NADC to provide a laboratory verification of the operation and performance of the AAES in an aircraft weapon system environment. The evolved simulator design is formulated around the TA-7C aircraft		

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electrical and avionic systems and the general physical/installation constraints of the TA-7C forward and mid fuselage sections. The designs developed under this contract were limited to electrical-avionic system definition and design primarily in the control and display areas. Simulator structural, system installation and wire harness designs are planned for development under a follow-on contract. The designs developed under this contract include the full application of the AAES technologies to the TA-7C electrical and avionic subsystems and systems. The AAES technologies include HVDC (High Voltage DC) Power Generation, SOSTEL (Solid State Electric Logic) Power Distribution and Management, and AMUX (Avionic Multiplexing).

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1.0 INTRODUCTION

The purpose of this program was to establish system requirements and develop various interface circuit designs and harnesses for making the control-display units of the TA-7C aircraft compatible with the requirements of the Advanced Aircraft Electrical System (AAES) Simulator. The designs evolved on this program primarily encompassed the circuits, panels, modules and harnesses for the TA-7C advisory-display and signal (control) functions. The level of design accomplished on this program involved only the electrical/electronic system and circuit details; the equipment installation, detail package design and wire harness designs are planned for development under a subsequent Full Scale Simulator Development Program. The design and documentation completed under this program are summarized herein and examples of the data and drawings are provided. The bulk documentation (data and drawings) will be delivered along with the AAES Simulator System.

2.0 SYSTEM DESIGN

Discussed in the following paragraphs are the design tasks performed toward the development of the AAES TA-7C Simulator. Tasks performed included the design of control-display circuits and assemblies and preparation of SOSTEL Control Group (SCG) data listings for the simulator system. The control-display related designs which were developed consisted of:

- o Cockpit interface unit design,
- o Design of twenty-four cockpit control panels,
- o Definition and design of SCG input signal conditioning circuits and assemblies,
- o Lighting power protection assembly design,
- o Definition and design of SCG output cards,
- o Design of lamp driver assemblies, and
- o Resistor-diode card assembly design

The data listing tasks involved establishing the system control requirements for the simulator and preparing listings of the following types:

- o Input signal data
- o Output signal data
- o Boolean equation list
- o Terminal I/O assignments

The results of these design tasks are described in the subsequent paragraphs.

2.1 Control-Display Circuit and Assembly Designs

Special assemblies were designed which provide the control-display functions for the TA-7C when interfaced to and controlled by the AAES ADM hardware. It is noted that the design tasks consisted of only establishing system, circuit and signal power interface designs for the control-display related equipment since tasks dealing with packaging and installation are to be performed on a subsequent Full Scale Simulator Development Program, Contract N62269-79-C-0220. As a consequence, most of the engineering drawings developed under this program are not totally complete as they will require the addition of wire harness interface and installation data developed under the subsequent

program. Drawings developed under this program will therefore be updated and completed as a part of the N62269-79-C-0220 contract and included with the deliverables of that contract.

The following paragraphs summarize the designs that were developed under this program. Since the drawings as a whole will be delivered under the C-0220 contract, designs and drawings which are representative of tasks performed on this program are included in this report.

2.1.1 Cockpit Interface Unit

A cockpit interface was designed that provides the necessary conditioning for control signals and load power compatible with the SCG requirements. Signals and functions accommodated by the cockpit interface units design include:

- o Altitude Radar Warning
- o Rudder Shaker Pedal
- o Angle of Attack
- o Head-up Display Hot and Fail Signals
- o Dimming control for IMS (Inertial Measurement System) Panel, HSI (Horizontal Situation Indicator), and the Head-up Display.

This design is contained on drawing number 83-80360.

2.1.2 Cockpit Control Panels

Selected control panels, a total of twenty four cockpit control panels, were redesigned to incorporate the switched impedance interface of the AAES. The primary method used in redesign of the panels was to design simulated switched impedance transducers and to integrate these into the control panel functions. Transducers redesigned for this application are listed below along with their respective drawing numbers.

<u>TRANSDUCER TYPE</u>	<u>VOUGHT DRAWING (MULTI-SHEET)</u>
Toggle	83-80326
Push, Lighted	83-80327
Rotary	83-80328
Push, Momentary	83-80329

The push lighted transducer design is shown in Figure 1 and is representative of the designs evolved. Control panels that were redesigned are summarized in Table 1. The Audio Forward and Aft Control Panels and the Forward and Aft Advisory/Caution Indicator Panels are representative of the evolved designs and are shown in Figures 2 and 3 respectively. Figures 4 and 5 are wire diagram drawings that contain the system interconnection details for these two sub-systems.

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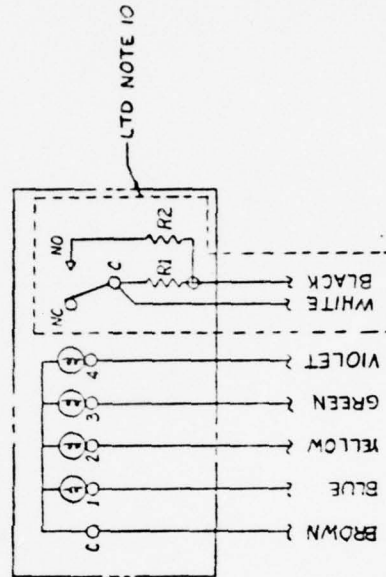
FIGURE 1

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SCHEMATIC



10620 PUSHBUTTON SWITCH

NOTE 3

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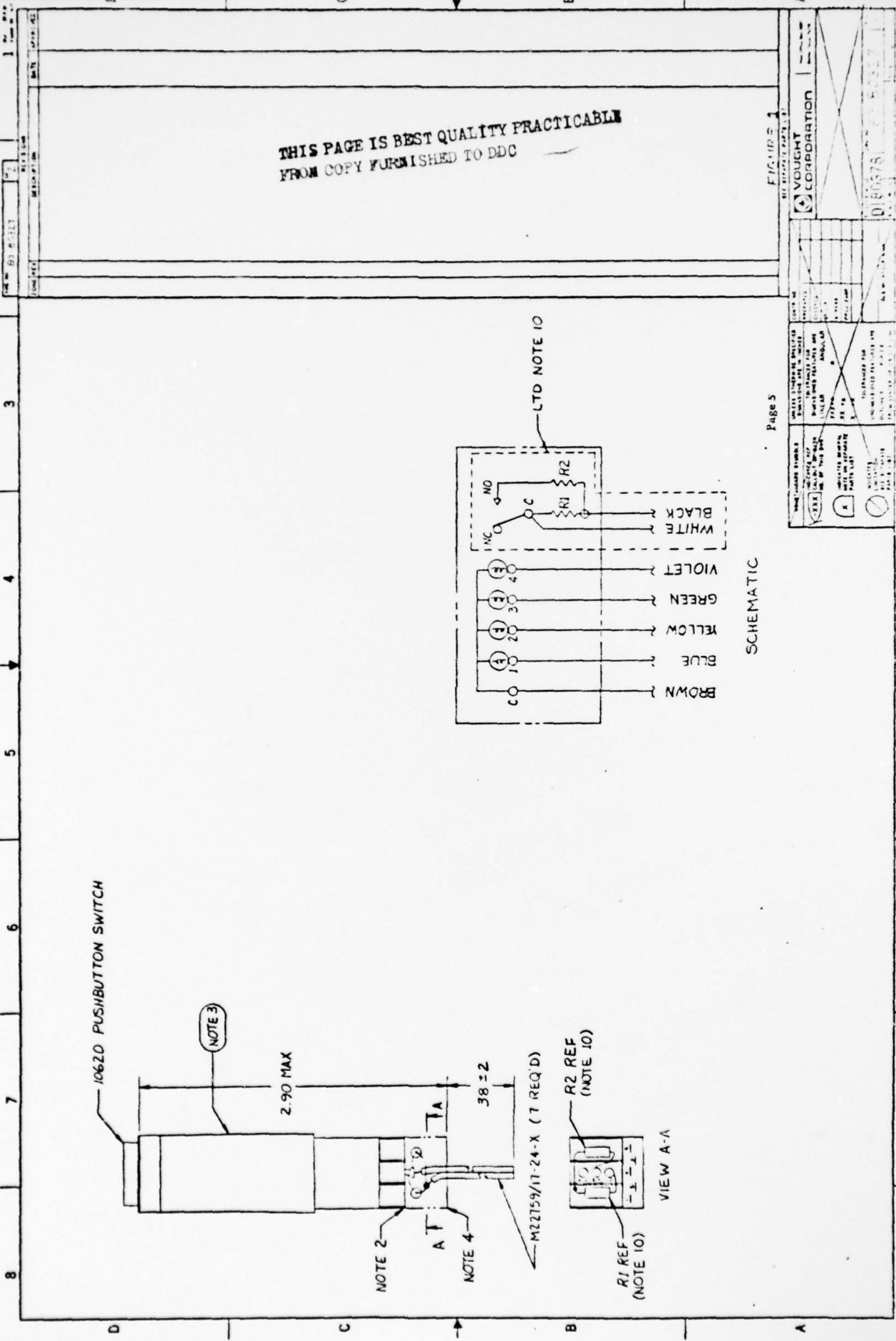
R2 REF
(NOTE 10)

R1 REF
(NOTE 10)

VIEW A-A

NOTE 2

NOTE 4



GENERAL NOTES

1. SOLDER ALL TERMINATIONS PER SPEC CVA11-215 USING SOLDER MATL QQ-S-571 SN60.
2. POTTING SHALL BE FLUSH WITH SWITCH SIDES TO PERMIT INSTALLATION AND REMOVAL OF MOUNTING SLEEVE.
3. THE TRANSDUCER DASH NUMBER SHALL BE DETERMINED BY THE LIST OF MATERIALS.
4. POT RESISTOR AND WIRE TERMINATION AREA WITH MIL-S-8516 EMBEDMENT COMPOUND PER PROCESS SPEC CVA6-228.
5. APPLY PART NUMBER (83-80327-XXX) TO SIDE OF TRANSDUCER PER SPEC CVA9-209 (1) OR (3).

6. CHECKOUT PROCEDURE AFTER EMBEDMENT:
 - A. VERIFY RESISTANCE ACROSS BLACK AND WHITE LEADS WITH OHMMETER AS INDICATED BELOW:

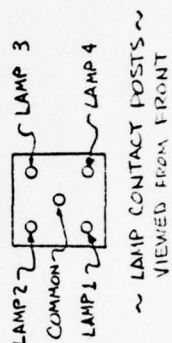
SWITCH POSITION	RESISTANCE (OHMS)
RELEASED	648 - 792
DEPRESSED	378 - 462

- B. DIELECTRIC STRENGTH - DIELECTRIC TEST VOLTAGE OF 500V RMS (60HZ) SHALL BE APPLIED BETWEEN THE FOLLOWING POINTS FOR A PERIOD OF 5 SECONDS (-0, +5"SEC). LEAKAGE CURRENT SHALL NOT EXCEED 100 MICROAMPERES AND THERE SHALL BE NO EVIDENCE OF ARCING, FLASHOVER OR OTHER DAMAGE.
 - A. TEST POINTS:
 1. ALL LEADS AND METAL CASE
 2. BLACK/WHITE LEADS AND ALL OTHER LEADS

- C. CONTINUITY TEST - WITH PUSHBUTTON LAMP HOUSING REMOVED, VERIFY RESISTANCE LESS THAN 1 OHM BETWEEN:
 1. LAMP 1 CONTACT POST AND BLUE LEAD
 2. 1 2 3 4 5
 3. 1 2 3 4 5
 4. LAMP 4
 5. COMMON CONTACT POST AND BROWN LEAD

7. LENGTH IN FEET.
8. ONE EACH OF THE FOLLOWING ASSEMBLIES SHALL BE FABRICATED FOR SIMULATOR STD PARTS STOCK:
 - 101 THRU -105
 - 107 THRU -112
 - 120 THRU -136
 - 139 THRU -161
9. TWO EACH OF THE FOLLOWING ASSEMBLIES SHALL BE FABRICATED FOR SIMULATOR STD PARTS STOCK:
 - 106, -113, -115 THRU -119, -137 AND -138
10. LIMITED TO -101 THRU -138.

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VOUGHT CORPORATION Post Office Box 5907 • Dallas, Texas 75227	SIZE	FSCN NO.	DWG NO.	REV
	B	80378	83-80327	-
SCALE		SHEET		3

B X 17
2-5528

Draw No. 83-80327 SH 4

QUANTITY REQUIRED	FIND NO./ REF DES	ZONE	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATL CODE	STOCK SIZE	FIN CODE	NOTE	UNIT WEIGHT
				83-80327 -101	TRANSDUCER, ELEC-PUSH LTD		(SAM LOW)			
				-102			(SAM MID)			
				-103			(SAM HI)			
				-104			(AAA)			
				-105			(A1)			
				-106			(UHF1/UHF2)			
				-107			(RADAR BOMB)			
				-108			(NORM ATTACK)			
				-109			(TERR FLW)			
				-110			(DATA LINK)			
				-111			(NAV BOMB)			
				-112			(OFFSET)			
				-113			(LDG)			
				-114			(LOW-ALT)			
				-115	TRANSDUCER, ELEC-PUSH LTD		(CMD/UHF)			
				-116			(CMD/NAV)			
				-117			(CMD/IFF)			
				-118			(CMD/RDR)			
				-119			(CMD/ACLS)			
				-120			(1/1/1)			
				-121			(2/2/2)			
				-122			(3/3/3)			
				-123			(4/4/4)			
				-124			(5/5/5)			
				-125			(6/6/6)			
				-126			(7/7/7)			
				-127			(8/8/8)			
				-128			(MET/MST/MET ARM)			
				-129			(T/TTL FUZE)			
				-130			(N/N/ NO FUZE)			
				-131			(GUN HI/GUN HI)			
				-132			(GUN LOW/GUN LOW)			
				-133			(RTD/RTD/RTD WPN)			
				-134			(CAMERA/CAMERA)			
				-135			(IP COOL/IR COOL)			
				-136			(FUEL DUMP)			
				-137			(ADI/AWM)			
				-138			(HUB/AWM)			
				-139			(RADAR BOMB)			
				-140			(NORM ATTACK)			
				-141			(TERR FLW)			
				-142			(DATA LINK)			
				-143	INDICATOR, ELEC-ARM LTD		(NAV BOMB)			

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REV	83-80327	SHEET 4
	83-80327	
SIZE	FSCM NO. B 80378	SCALE NONE
VOUGHT CORPORATION		
List of Materials		

MS 5

QUANTITY REQUIRED	FIND NO./ REF DES	ZONE	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATL CODE	STOCK SIZE	FIN CODE	NOTE	UNIT WEIGHT
				83-80327-144 -145 -146 -147 -148 -149 -150 -151 -152 -153 -154 -155 -156 -157 -158 -159 -160 83-80327 -161	INDICATOR, ELEC-RUSH LID		(OFFSET) (1/1) (2/2) (3/3) (4/4) (5/5) (6/6) (7/7) (8/8) (NS FUZE/NS FUZE) (TL FUZE/TL FUZE) (MST ARM/MST ARM) (GUN HI) (GUN LOW) (RTD WPN/RTD WPN) (CAMERA) (IR COOL) (FUEL DP)			
					INDICATOR, ELEC-RUSH LTD		THIS PAGE IS BEST QUALITY PRACTICABLE FROM COPY FURNISHED TO DDC			

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SIZE FSCM NO. **B 80378** PL
SCALE NONE

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DWG NO. 83-80327 SH 6

QUANTITY REQUIRED							FIND NO./ REF DES	ZONE	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MTRL CODE	STOCK SIZE	FIN CODE	NOTE	UNIT WEIGHT
-106	-105	-104	-103	-102	-101											
1	1	1	1	1	1		R1			RLR07C7500GM	RESISTOR - 750 OHM		MIL-R-39017/1		7	
1	1	1	1	1	1		R2			RLR07C1001GM	RESISTOR - 1000 OHM		MIL-R-39017/1		7	
32	32	32	32	32	32					M227S9/17-24-0	WIRE - BLACK				7	
										-1	- BROWN				7	
										-4	- YELLOW				7	
										-5	- GREEN				7	
										-6	- BLUE				7	
										-7	- VIOLET				7	
32	32	32	32	32	32					M227S9/17-24-9	WIRE - WHITE				7	
										CVA6-22B	PROCESS SPEC	M1				
										CVA11-215	PROCESS SPEC	M2				
										10620VTI-1	SWITCH - PUSH LIGHTED		0.2 CU IN (EST)			
									08719	10620VTI-2						
									08719	10620VTI-3						
									08719	10620VTI-4						
									08719	10620VTI-5						
									08719	10620VTI-6	SWITCH - PUSH LIGHTED					

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QUANTITY REQUIRED						FIND NO./ REF DES	ZONE	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATL CODE	STOCK SIZE	FIN CODE	NOTE	UNIT WEIGHT
-112	-111	-110	-109	-108	-107										
1	1	1	1	1	1	R1			KL07C75005M	RESISTOR - 750 OHM		MIL-R-39017/1		7	
1	1	1	1	1	1	R2			KL07C10015M	RESISTOR - 1000 OHM		MIL-R-39017/1		7	
32	32	32	32	32	32				M22759/17-24-0	WIRE - BLACK				7	
									-1	- BROWN				7	
									-4	- YELLOW				7	
									-5	- GREEN				7	
									-6	- BLUE				7	
									-7	- VIOLET				7	
									M22759/17-24-9	WIRE - WHITE	M1	0.2 CU IN (EST)		7	
									CVA6-22B	PROCESS SPEC	M2				
									CVA11-215	PROCESS SPEC					
								08719	10620VTJ-7	SWITCH - PUSH LIGHTED					
								08719	10620VTJ-8						
								08719	10620VTJ-9						
								08719	10620VTJ-10						
								08719	10620VTJ-11						
								08719	10620VTJ-12	SWITCH - PUSH LIGHTED					

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-112	-117	-116	-115	-113										
1	1	1	1	1	R1			RLR07C15003M	RESISTOR - 750 OHM		MIL-R-39C17/1		7	
1	1	1	1	1	R2			RLR07C1001G1M	RESISTOR - 1000 OHM		MIL-R-39017/1		7	
32	32	32	32	32				M22759/17-24-0	WIRE - BLACK				7	
								-1	- BROWN				7	
								-4	- YELLOW				7	
								-5	- GREEN				7	
								-6	- BLUE				7	
								-7	- VIOLET				7	
32	32	32	32	32				M22759/17-24-9	WIRE - WHITE	M1	0.2 CU IN (EST)		7	
X	X	X	X	X				CVA6-22B	PROCESS SPEC	M2				
X	X	X	X	X				CVA11-215	PROCESS SPEC					
							08719	10620VTI-13	SWITCH - PUSH LIGHTED					
							08719	10620VT						
							08719	10620VTI-15						
							08719	10620VTI-16						
							08719	10620VTI-17						
							08719	10620VTI-18	SWITCH - PUSH LIGHTED					

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-174	-123	-122	-121	-120	-119										
1	1	1	1	1	1	R1			RLR07C75005M	RESISTOR - 750 OHM		MIL-R-39017/1			
1	1	1	1	1	1	R2			RLR07C1001GM	RESISTOR - 10.0 OHM		MIL-R-39017/1			
32	32	32	32	32	32				M22759/17-24-0	WIRE - BLACK				7	
									-1	- BROWN				7	
									-4	- YELLOW				7	
									-5	- GREEN				7	
									-6	- BLUE				7	
									-7	- VIOLET				7	
32	32	32	32	32	32				M22759/17-24-9	WIRE - WHITE	M1	0.2 CU IN (EST)			
									CVA6-228	PROCESS SPEC	M2				
									CVA11-215	PROCESS SPEC					
								08719	10620VTI-19	SWITCH - PUSH LIGHTED					
								08719	10620VTI-20						
								08719	10620VTI-21						
								08719	10620VTI-22						
								08719	10620VTI-23						
								08719	10620VTI-24	SWITCH - PUSH LIGHTED					

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QUANTITY REQUIRED						FIND NO./ REF DES	ZONE	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATL CODE	STOCK SIZE	FIN CODE	NOTE	UNIT WEIGHT
-130	-129	-128	-127	-126	-125										
1	1	1	1	1	1	R1			RLR07C1001GM	RESISTOR - 750 OHM		MIL-R-39017/1		7	
1	1	1	1	1	1	R2			RLR07C1001GM	RESISTOR - 1000 OHM		MIL-R-39017/1		7	
32	32	32	32	32	32				M22759/17-24-0	WIRE - BLACK				7	
									-1	- BROWN				7	
									-4	- YELLOW				7	
									-5	- GREEN				7	
									-6	- BLUE				7	
									-7	- VIOLET				7	
32	32	32	32	32	32				M22759/17-24-9	WIRE - WHITE	M1	0.2 CU IN (EST)		7	
									CVA6-22B	PROCESS SPEC	M2				
									CVA11-215	PROCESS SPEC					
								08719	10620VTI-25	SWITCH - PUSH LIGHTED					
								08719	10620VTI-26						
								08719	10620VTI-27						
								08719	10620VTI-28						
								08719	10620VTI-29						
								08719	10620VTI-30	SWITCH - PUSH LIGHTED					

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SIZE	FSCM NO.	DSG NO.	REV
B	80378	83-80327	10
SCALE NONE		SHEET	
VOUGHT CORPORATION Post Office Box 5907 - Dallas, Texas 75222			

8 X 17
2-5324

DWG NO. 83-80327 SM 11

QUANTITY REQUIRED				FIND NO./ REF DES	ZONE	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATL CODE	STOCK SIZE	FIN CODE	NOTE	UNIT WEIGHT
-136	-135	-124	-133	-132	-131								
1	1	1	1	1	1		RLR07C1000M RLR07C1001GM	RESISTOR - 750 OHM RESISTOR - 1000 OHM		MIL-R-39217/1 MIL-R-39017/1		7	
32	32	32	32	32	32		M22759/17-24-0 -1 -4 -5 -6 -7	WIRE - BLACK - BROWN - YELLOW - GREEN - BLUE - VIOLET				7	
32	32	32	32	32	32		M22759/17-24-9 CVA6-22B CVA11-215	WIRE - WHITE PROCESS SPEC PROCESS SPEC	M1 M2	0.2 CU IN (EST)		7	
						08719	10620VT1-31	SWITCH - PUSH LIGHTED					
						08719	10620VT1-32						
						08719	10620VT1-33						
						08719	10620VT1-34						
						08719	10620VT1-35						
						08719	10620VT1-36	SWITCH - PUSH LIGHTED					

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REV	83-80327	SHEET	11
SIZE FSCM NO	B 80378	DWG NO.	83-80327
SCALE	NONE		
VOUGHT CORPORATION Plant Office Box 5907 - Dallas Texas 75224			

W X 17
Z-3128

OWB NO. 83-80327 SH 12

QUANTITY REQUIRED					FIND NO./ REF DES	ZONE	FSCM NO.	PART OR IDENTIFYING NO.	NOVENCLATURE OR DESCRIPTION	MATL CODE	STOCK SIZE	FIN CODE	NOTE	UNIT WEIGHT
-142	-141	-140	-139	-138										
					R1 R2			RLR07C1000GM RLR07C1000GM	RESISTOR - 750 OHM RESISTOR - 1000 OHM		MIL-R-39017/1 MIL-R-39017/1			
3.2	3.2	3.2	3.2	3.2				M22759/17-24-0	WIRE - BLACK WIRE - BROWN				7	
3.2	3.2	3.2	3.2	3.2				-1 -4 -5	- YELLOW - GREEN				7	
3.2	3.2	3.2	3.2	3.2				-6 -7	- BLUE - VIOLET				7	
3.2	3.2	3.2	3.2	3.2				M22759/17-24-9 CVA6-228 CVA11-215	WIRE - WHITE PROCESS SPEC PROCESS SPEC	M1 M2	0.2 CU IN (EST)		7	
X	X	X	X	X			08719	10620VTI-37	SWITCH - PUSH LIGHTED					
X	X	X	X	X			08719	10620VTI-38						
							08719	10620VTI-39						
							08719	10620VTI-40						
							08719	10620VTI-41						
							08719	10620VTI-42	SWITCH - PUSH LIGHTED					

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REV	83-80327
SIZE / FSCM NO.	B / 80378
OWB NO.	83-80327
SCALE	NONE
SHEET	1/2
VOUGHT CORPORATION Post Office Box 5817 - Dallas Texas 75222	

QUANTITY REQUIRED										FIND NO./ REF DES	ZONE	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL CODE	STOCK SIZE	FIN CODE	NOTE	UNIT WEIGHT
-148	-147	-146	-145	-144	-143														
						R1													
						R2													

B X 17
2-5526

DWG NO. 83-80327 SM 14

QUANTITY REQUIRED				FIND NO./ REF DES	ZONE	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATL CODE	STOCK SIZE	FIN CODE	NOTE	UNIT WEIGHT
-154	-153	-152	-151	-150	-149								
					R1 R2		RLR07C1000GM RLR07C1001GM M22759/17-24-0 -1 -4 -5 -6 -7 M22759/17-24-9 CVA6-22B CVA11-215	RESISTOR - 750 OHM RESISTOR - 1000 OHM WIRE - BLACK WIRE - BROWN WIRE - YELLOW WIRE - GREEN WIRE - BLUE WIRE - VIOLET WIRE - WHITE PROCESS SPEC PROCESS SPEC		MIL-R-39017/1 MIL-R-39017/1		7 7 7 7 7 7 7	
						08719	10620VTI-49	SWITCH - PUSH LIGHTED	M1 M2	0.2 CU IN (EST)			
						08719	10620VTI-50						
						08719	10620VTI-51						
						08719	10620VTI-52						
						08719	10620VTI-53						
						08719	10620VTI-54						

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REV	83-80327
SIZE / FSCM NO.	B 80378
DWG NO.	83-80327
SCALE	NONE
SHEET	14

8 X 17
2-5526

QWG NO. 83-80327 SP 15

QUANTITY REQUIRED					FIND NO./ REF DES	ZONE	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL CODE	STOCK SIZE	FIN CODE	NOTE	UNIT WEIGHT
-160	-159	-158	-157	-156	-155									
					R1 R2			RLR07C1500ISM RLR07C1001GM	RESISTOR - 750 OHM RESISTOR - 1000 OHM		MIL-R-39017/1 MIL-R-39017/1			
3.2	3.2	3.2	3.2	3.2				M22T59/17-24 -0	WIRE - BLACK - BROWN				7	
3.2	3.2	3.2	3.2	3.2				-1 -4 -5					7	
3.2	3.2	3.2	3.2	3.2				-6 -7					7	
3.2	3.2	3.2	3.2	3.2				M22T59/17-24 -9	WIRE - WHITE				7	
3.2	3.2	3.2	3.2	3.2				CVA6-22B CVA11-215	PROCESS SPEC PROCESS SPEC	M1 M2	0.2 CU IN (EST)		7	
							08719	10620VTI-55	SWITCH - PUSH LIGHTED					
							08719	10620VTI-56						
							08719	10620VTI-57						
							08719	10620VTI-58						
							08719	10620VTI-59						
							08719	10620VTI-60	SWITCH - PUSH LIGHTED					

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VOUGHT CORPORATION <small>Post Office Box 5907 • Kansas City, Mo. 64112</small>		QWG NO. 83-80378	QWG NO. 83-80327	REV 15
SCALE NONE				

X 17
2-5326

DWG NO. B3-80227 SH 16

QUANTITY REQUIRED	FIND NO./ REF DES	ZONE	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATL CODE	STOCK SIZE	FIN CODE	NOTE	UNIT WEIGHT
-161	R1 R2			R1R07C7500GM R1R07C1000GM M22759/17-24-0 -1 -4 -5 -6 -7 M22759/17-24-9 CVA6-228 CVA1F-215 10620VTI-61	RESISTOR - 750 OHM RESISTOR - 1000 OHM WIRE - BLACK - BROWN - YELLOW - GREEN - BLUE - VIOLET WIRE - WHITE PROCESS SPEC PROCESS SPEC SWITCH - PUSH LIGHTED		MIL-R-39017/1 MIL-R-39017/1 0.2 CU IN (EST)		7 7 7 7 7 7 7	
3.2										
3.2										
3.2										
3.2										
3.2										
X										
X										
1			08319			M1 M2				

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19

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SIZE FSCM NO.	DWG NO.	REV
B 80378	B3-80227	16
SCALE NONE	SHEET	

VOUGHT
CORPORATION
Pawtucket Box 500 • Pawtucket, R.I. 02860

TABLE 1

COCKPIT CONTROL PANEL DESIGNS

<u>CONTROL PANEL NAME</u>	<u>VOUGHT DRAWING</u>
Left Cowl Switch Assembly, Forward	83-80331 (PP33)
Right Cowl Switch Assembly, Forward	83-80331 (PP32)
Command/Transfer Panel, Forward and Aft	83-80332 (PP41)
Armament Release Panel	83-80333 (PP42)
Pilot Generator Control Panel, Forward	83-80334 (PP5)
Pilot Generator Control Panel, Aft	83-80335 (PP45)
Left Slant Panel, Forward	83-80336 (PP19)
Left Slant Panel, Aft	83-80337 (PP19)
Fuel Management Panel, Forward	83-80338 (PP6)
Fuel Management Panel, Aft	83-80339 (PP53)
Flap Quadrant Panel, Forward	83-80340 (PP63)
Flap Quadrant Panel, Aft	83-80340 (PP64)
UHF Squelch Panel, Forward and Aft	83-80341 (RU1)
Audio Control Panel, Forward and Aft	83-80342 (PP39)
Advisory/Caution Panel, Forward and Aft	83-80343 (PP24)
Interior-Exterior Lights Control Panel, Forward	83-80345 (PP3)
Interior Lights Control Panel, Aft	83-80345 (PP4)
Wingfold Assembly	83-80346 (G1)
Right Slant Panel, Forward	83-80347 (PP10)
Right Slant Panel, Aft	83-80348 (PP10)
ADI/HSI Disable Panel	83-80349 (PP50)
Right Cowl Light/Switch Assembly, Aft	83-80350 (PP48)
Left Cowl Light/Switch Assembly, Aft	83-80350 (PP49)
Throttle Quadrant, Forward and Aft	83-80352 (PP62)

M CODE		MATERIAL/MATERIAL SPEC		REV		DESCRIPTION		DATE		APPROVED		REV		DESCRIPTION		DATE		APPROVED	
F CODE		FINISH		QUANTITY REQD		USED ON		NEXT ASSEMBLY		FROM		THRU		CONTR NO		PREP		CHKD	
20				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

S H E E T

REVISION STATUS OF SHEETS

FIGURE 2

VOUGHT CORPORATION
PANEL, ASSY, AUDIO
FWD & AFT, REWORK OF

CONTR NO 11-2269-78 C-0126

Post Office Box 3907
Dallas, Texas 75202

PREP L L NELSON

SIZE B 80378

CHKD

SCALE NONE

GROUP

DESIGN GROUP NAME

STRESS

ELECTRICAL

PROJ

REV

NOTES:

1. THIS DRAWING PROVIDES INSTRUCTIONS AND DEFINES THE PARTS REQUIRED TO REWORK AND RE-IDENTIFY THE 220-21362-101 PANEL TO A 83-80342-101 PANEL.
2. REWORK AND RE-IDENTIFY THE 220-27747-101 WIRING HARNESS TO THE 83-80342-102 HARNESS AS DESCRIBED ON THIS DRAWING AND WIRING DIAGRAM 83-80330-PP39
3. ASSEMBLE CONNECTOR PER SPEC CVA11-162/35, SECT A.
4. ASSEMBLE SPLICE PER SPEC CVA 11-153/2, SECT D.
5. IDENTIFY HARNESS PER SPEC CVA 11-127.
6. ESTIMATED LENGTH IN FEET.
7. THIS PART IS PROVIDED BY THE NAVAL AIR DEVELOPMENT CENTER (NADC).
8. VENDOR ITEM, SEE SPEC CONTROL DRAWING.
9. NADC-30-T3-7603/05-21 IS AN ACCEPTABLE ALTERNATE PART FOR 83-80326-102.
10. NADC-30-T3-7603/05-22 IS AN ACCEPTABLE ALTERNATE PART FOR 83-80326-101.
11. SHAFT MUST BE FULLY ROTATED COUNTERCLOCKWISE BEFORE KNOBS ARE RE-INSTALLED. INSTALLED POSITION IS SHOWN.
12. INSTALL 202-29403-3W6 TUBING ON STUB LEADS OF SWITCHES S1 & S2 WITH SWITCH REFERENCE DESIGNATOR STAMPED ON TUBING.

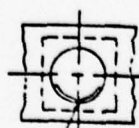
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VOUGHT CORPORATION <small>Post Office Box 5407 - Omaha, Nebr 68122</small>	SIZE	FSCU NO	DWG NO.	REV
	B	80378	83-80342	2
SCALE			SHEET	
			2	

8 X 17
2-51326

DWG NO. 83-80342 3H 3

QUANTITY REQUIRED		FIND NO./ REF DES	ZONE	FSCM NO.	PART OR IDENTIFYING NO.	NOVENCATURE OR DESCRIPTION	MATL CODE	STOCK SIZE	FIN CODE	NOTE	UNIT WEIGHT
	-102	-101			-101	PANEL, ASSY				1	
			W I		-102	WIRING HARNESS				2	
					220-21362-101	PANEL, ASSY				1,7	
					220-27747-101	WIRING HARNESS				2	
					83-80326-101	SWITCH, TRANSDUCER TOGGLE				10,12	
			S1		83-80326-102	SWITCH, TRANSDUCER TOGGLE				9,12	
			S2								
	2				M22159/16-22-9	WIRE				6	
					202-26404-2	SPLICE				4,8	
	1				202-29402-5-4	TUBING				4,8	
	1				202-29403-3W6	TUBING				8,12	
	5										



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[illegible]

M CODE		MATERIAL/MATERIAL SPEC		REV		DESCRIPTION		DATE		APPROVED		REV		DESCRIPTION		DATE		APPROVED	
F CODE		FINISH																	
<div style="display: flex; justify-content: space-between;"> <div> <p>DATE NO. 83-80343</p> <p>REV 1</p> </div> <div> <p>FIGURE 3</p> <p>VOUGHT CORPORATION</p> <p>PANEL INDICATOR, ADV/CAUT, FND & AFT COCKPIT, REWORK OF</p> </div> <div> <p>CONTR NO. 16-026974-0026</p> <p>PREP L. L. HEUSEL</p> <p>CHKD</p> <p>GROUP</p> <p>STRESS</p> <p>PROJ</p> </div> <div> <p>THRU</p> <p>FROM</p> <p>NEXT ASSEMBLY</p> <p>QUANTITY REQD</p> <p>MA</p> <p>USED ON</p> <p>DASH NO.</p> </div> </div>																			
<div style="display: flex; justify-content: space-between;"> <div> <p>20</p> <p>19</p> <p>18</p> <p>17</p> <p>16</p> <p>15</p> <p>14</p> <p>13</p> <p>12</p> <p>11</p> <p>10</p> <p>9</p> <p>8</p> <p>7</p> <p>6</p> <p>5</p> <p>4</p> <p>3</p> <p>2</p> <p>1</p> </div> <div> <p>AAES SIMULATOR</p> <p>AAES SIMULATOR</p> </div> <div> <p>1</p> <p>1</p> </div> <div> <p>1</p> <p>1</p> </div> </div>																			
<div style="display: flex; justify-content: space-between;"> <div> <p>REVISION STATUS OF SHEETS</p> <p>REVISION 1 OF 5</p> </div> <div> <p>SIZE B</p> <p>80378</p> <p>83-80343</p> </div> <div> <p>SCALE NONE</p> <p>FIGURE 3</p> </div> </div>																			

NOTES:

1. THIS DRAWING PROVIDES INSTRUCTIONS AND DEFINES THE PARTS REQUIRED TO REWORK AND RE-IDENTIFY THE 220-21353-101 (FWD) & -102 (AFT) PANELS INTO 83-80343-101 & -102 PANELS RESPECTIVELY.
2. REWORK AND RE-IDENTIFY THE 218-27792-1 WIRING HARNESS TO THE 83-80343-103 WIRING HARNESS AS DESCRIBED ON THIS DRAWING AND WIRING DIAGRAM 83-80350-PP24.
3. ASSEMBLE CONNECTOR PER SPEC CVA11-162/12, SECT A, EXCEPT STRIP #24 GAGE WIRE AS FOLLOWS: 'STRIP' BACK INSULATION LEAVING 24/64 TO 28/64 INCH OF EXPOSED WIRE. FOLD BACK EXPOSED WIRE ON ITSELF TO OBTAIN 12/64 TO 14/64 INCH OF EXPOSED LENGTH (FOLDED) PRIOR TO INSERTING INTO CONTACT FOR CRIMPING.
4. ASSEMBLE SPLICE PER SPEC CVA11-153/2, SECT D.
5. IDENTIFY HARNESS PER SPEC CVA11-127.
6. ESTIMATED LENGTH IN FEET.
7. THIS PART IS PROVIDED BY THE NAVAL AIR DEVELOPMENT CENTER (NADC).
8. VENDOR ITEM, SEE SPEC CONTROL DRAWING.
9. INSTALL END CAP PER SPEC CVA11-153/1, SECT G.
10. NADC-30-T3-7603/05-21 IS AN ACCEPTABLE ALTERNATE PART FOR 83-80326-102.
11. INSTALL 202-29403-3W6 TUBING ON STUB LEADS OF SWITCHES 31 & 32 WITH SWITCH REFERENCE DESIGNATOR STAMPED ON TUBING.
12. NADC-30-T3-7603/12-003 IS AN ACCEPTABLE ALTERNATE PART FOR 83-80329-101.
13. MARKING SHALL BE APPLIED PER SPEC CVA9-209(1) OR (3).

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VOUGHT CORPORATION <small>Plant Office Box 5067 • Dallas Texas 75222</small>	SIZE / FSC NO.	DWG NO.	REV
	B 80378	83-80343	2
SCALE 1/4" = 1"		SHEET	

8 X 17
2-9328

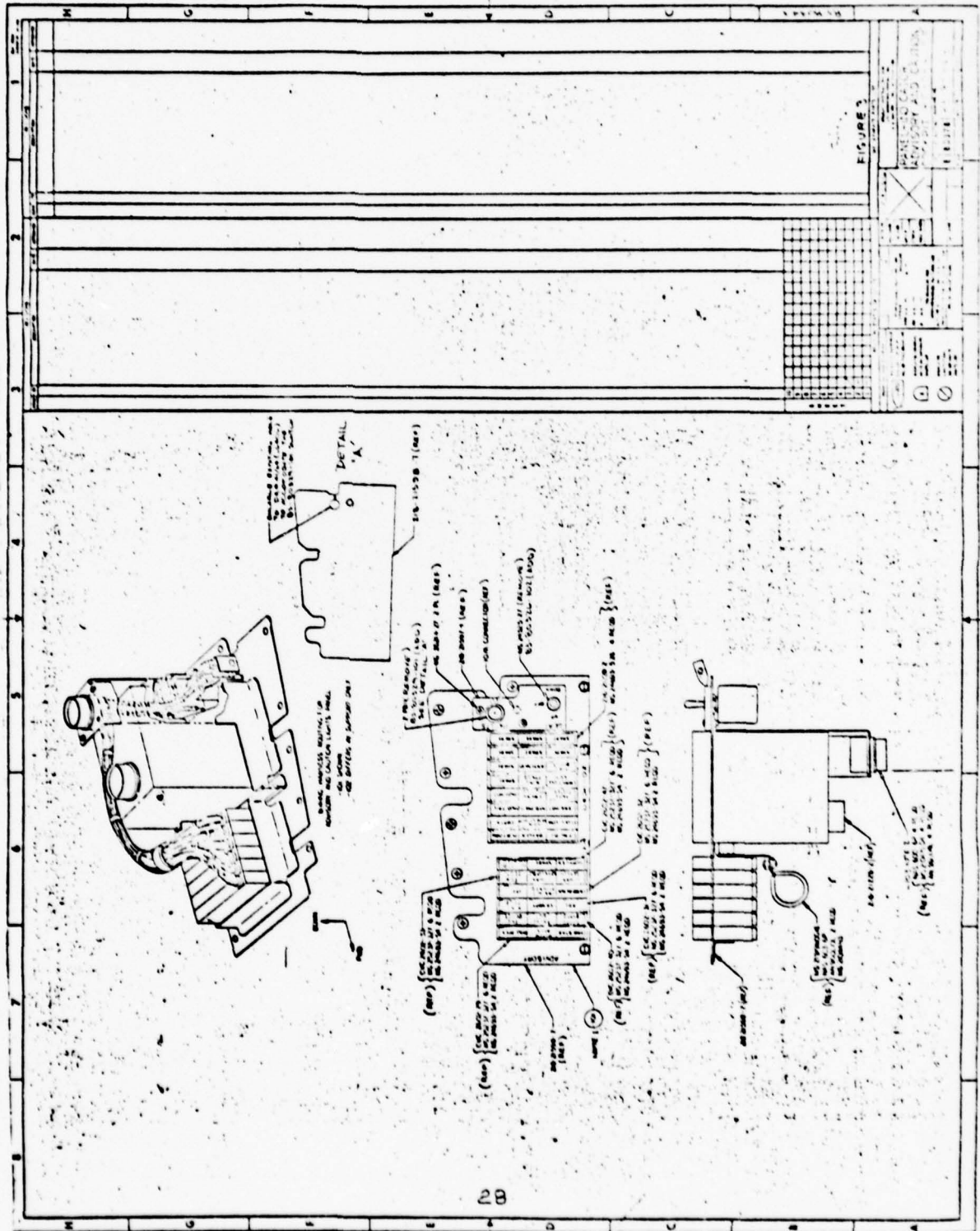
QWS NO. 83-80343 SH 3

QUANTITY REQUIRED			FIND NO./ REF DES	ZONE	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATL CODE	STOCK SIZE	FIN CODE	NOTE	UNIT WEIGHT
	-103	-102	-101				PANEL, FWD				1	
		-				-102	PANEL, AFT				1	
		1	W1			-103	WIRING HARNESS				2,5	
		REF REF				218-27792-1	WIRING HARNESS				2	
		1				220-21353-101	PANEL, FWD				1,7	
		1				220-21353-102	PANEL, AFT				1,7	
		1				83-80326-102	SWITCH, TRANSDUCER, TOGGLE				10,11	
		1	S1			83-80329-101	SWITCH, TRANSDUCER, PUSHEUTTON				11,12	
	1					202-26404-2	SPLICE				4,8	
	1					202-29402-5-4	TUBING				4,8	
	5					202-29403-3W6	TUBING				8,11	
	1					TC4001 CRN	END CAP		CPC 13C35		9	

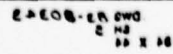
VOUGHT CORPORATION <small>Post Office Box 1987 • Dallas, Texas 75221</small>	SIZE	FSCM NO.	QWS NO.	REV.
	B	80378	83-80343	3
SCALE NONE			SHEET	

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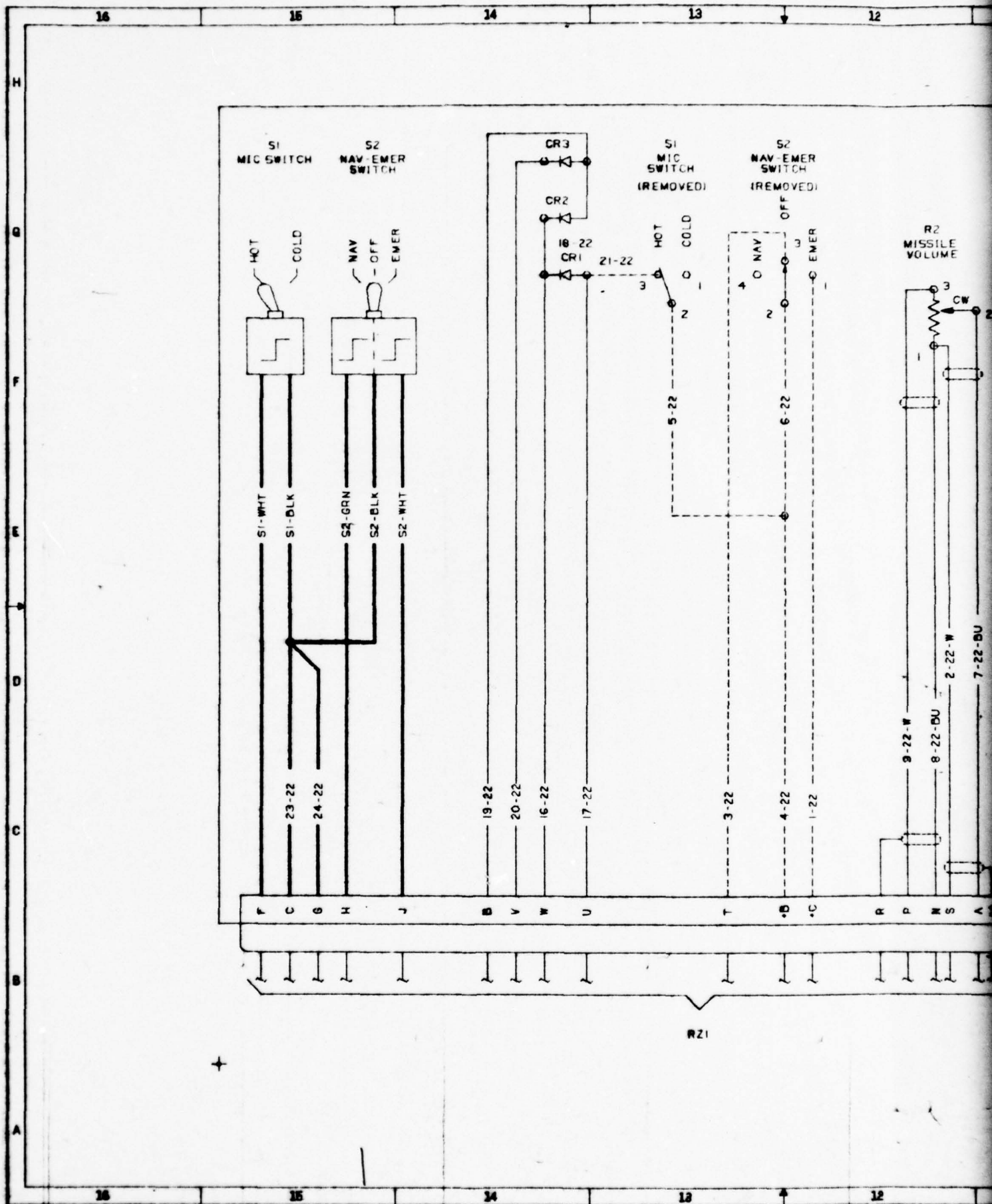
100-44
100-44
100-44



04 X 14
24 2
040000 - 00100



34 X 90
SH
DMG



52
EMER
WITCH
MOVED:
OFF
3
EMER

2
6-22
1-22

4-22
1-22

R P M S A A K L M Y X Z D E

P2024
P2215

L3
L6

12 11 10 9 8 4

R2
MISSILE
VOLUME

R1
INTERCOM
VOLUME

R3

NOTES:

1 THIS DIAGRAM SHOWS THE WIRING INFORMATION FOR THE 83-80342-101 AUDIO CONTROL PANEL.

2 HARNESS 220-27747-101 REWORKED AND RE-IDENTIFIED TO 83-80342-102.

3 FORWARD COCKPIT ONLY.

4 AFT COCKPIT ONLY.

5 WIRE LEGEND:

- EXISTING
- - - REMOVED
- ADDED

A216 3
A2086 4
AUDIO PANEL

EDGE
LIGHTED
PANEL

J1

J2

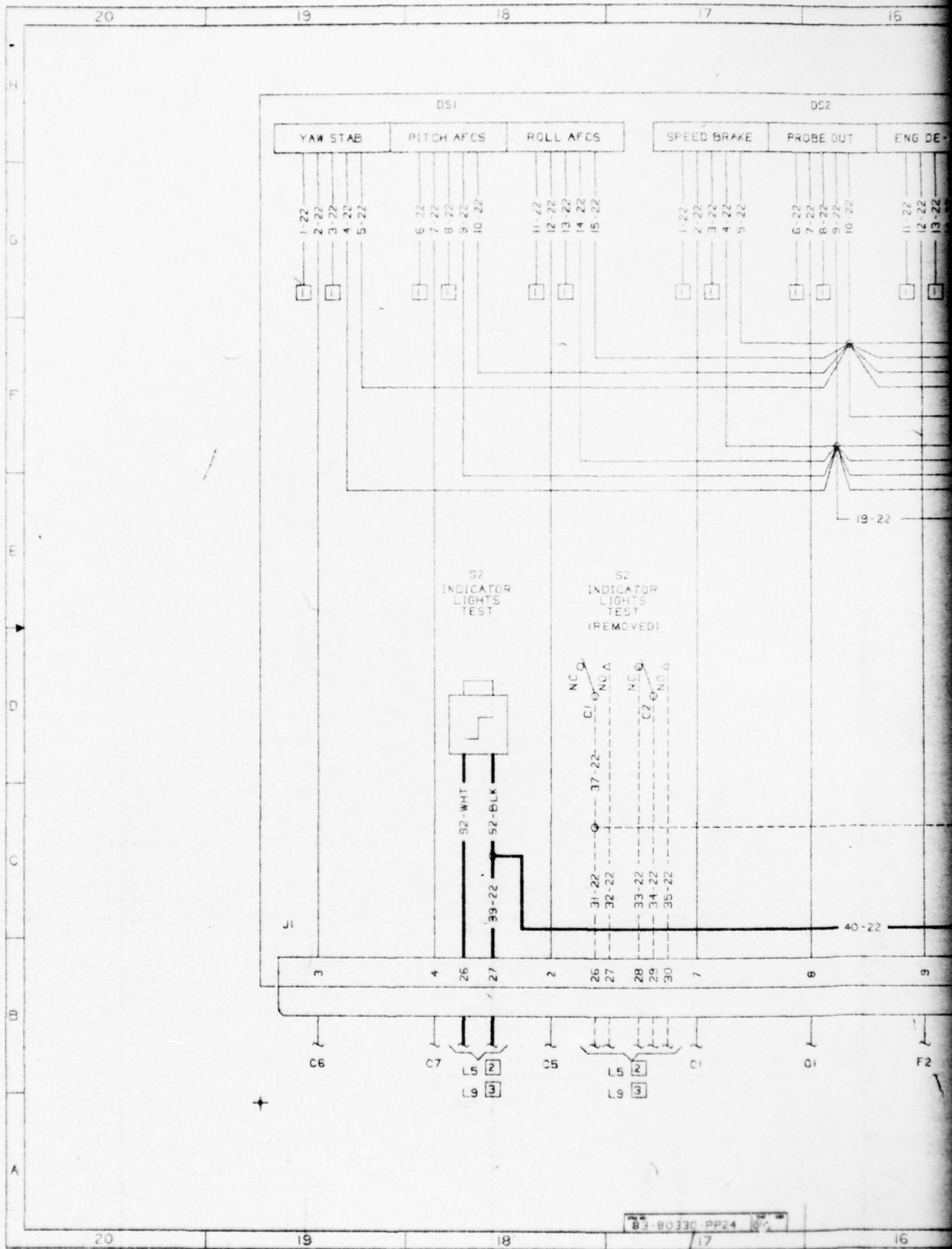
2

8	4	3	2	1
<div> <div> <div>REVISIONS</div> <div> <div>NO.</div> <div>DATE</div> <div>DESCRIPTION</div> </div> </div> <div> <div>FIGURE 4</div> <div> <div>AAES WIRING DIAGRAM</div> <div>AUDIO CONTROL</div> <div>PANEL - FWD & AFT</div> </div> <div> <div>11007093-80330-PP39</div> </div> </div> </div>				

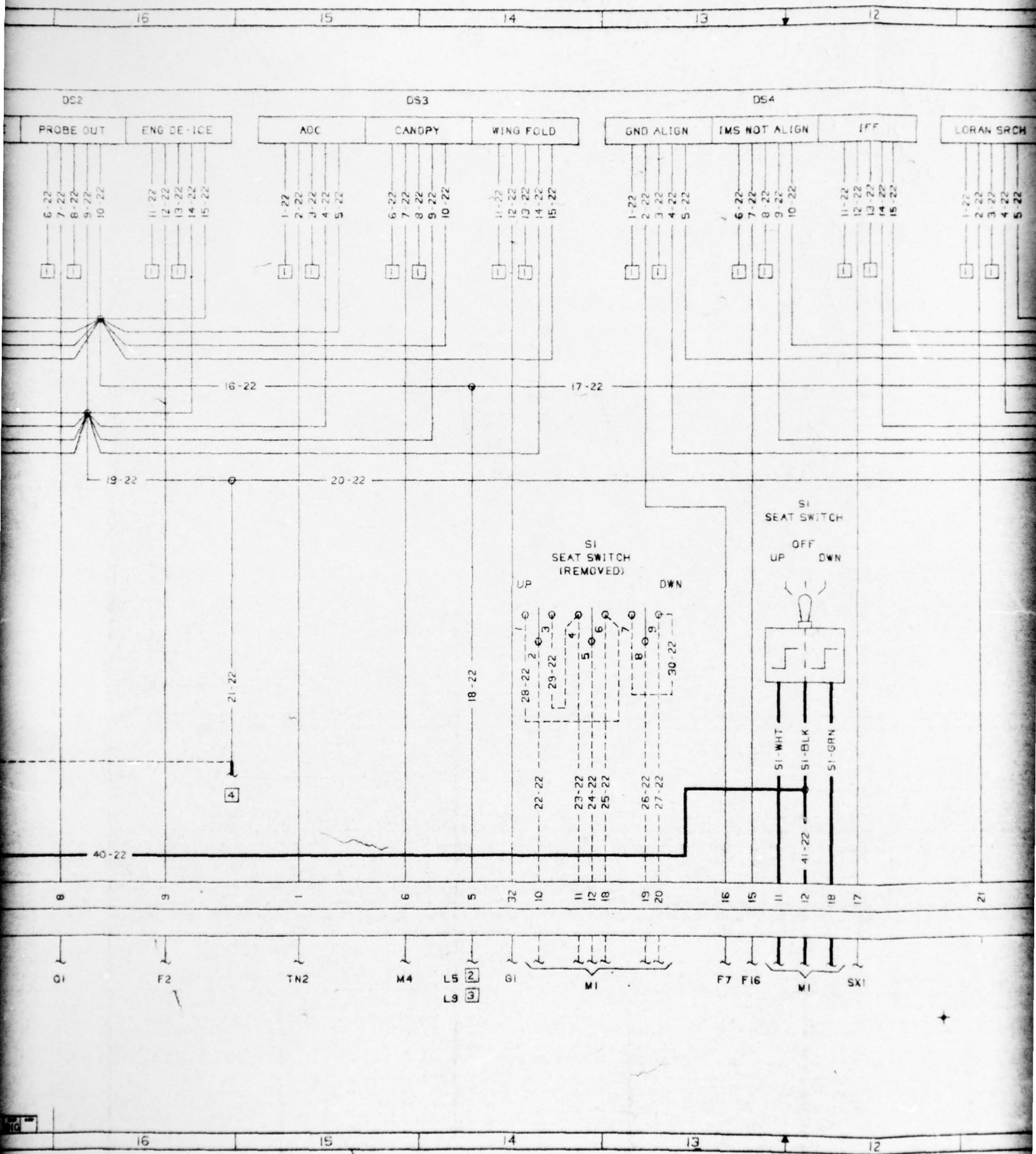
H
G
F
E
D
C
B
A

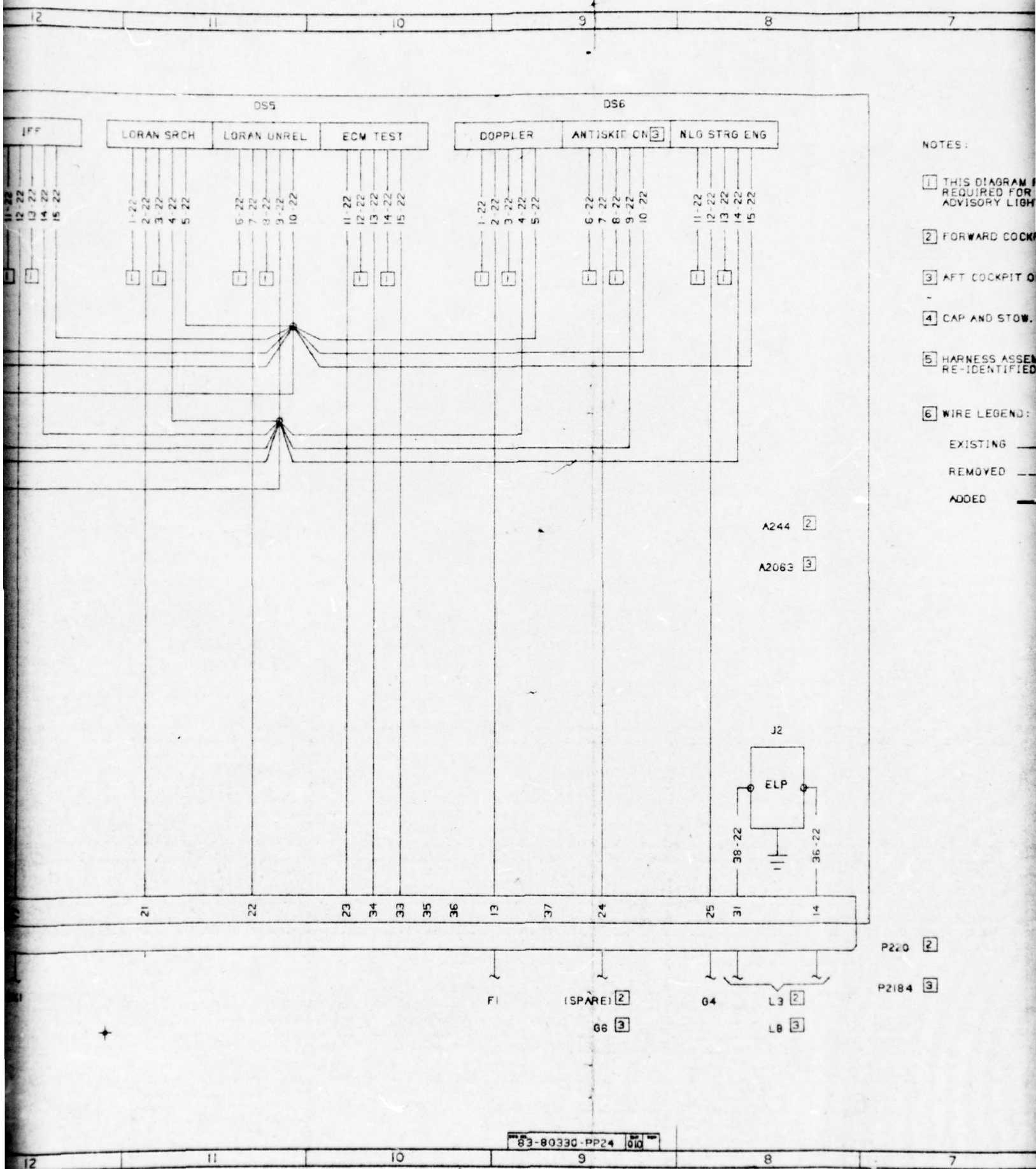
3

34 X 110
011 2H



83-80330-PP24





NOTES:

1 THIS DIAGRAM PROVIDES THE WIRING INFORMATION
REQUIRED FOR THE FORWARD AND AFT
ADVISORY LIGHTS PANEL.

2 FORWARD COCKPIT ONLY.

3 AFT COCKPIT ONLY.

4 CAP AND STOW.

5 HARNESS ASSEMBLY 218-27792-1 REWORKED AND
RE-IDENTIFIED TO 83-80343-103.

6 WIRE LEGEND:

EXISTING _____

REMOVED - - - - -

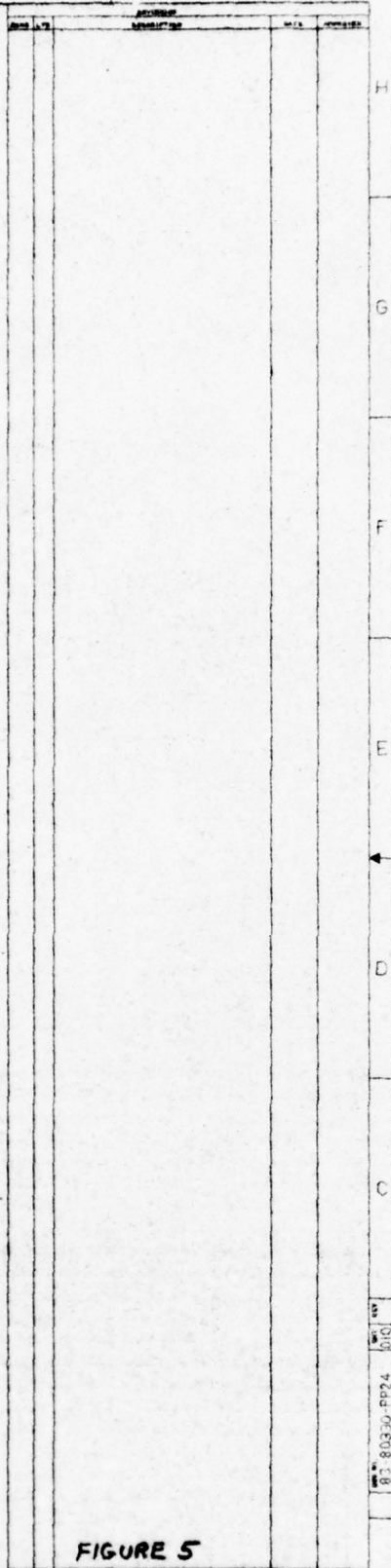
ADDED _____

P220 2

P2184 3

3

2



VOLVOY CORPORATION		TELEPHONE
AAES WIRING DIAGRAM		
ADVISORY		
LIGHTS PANEL		
J1803/8183-80330-PP24		
SCALE: 1/8" = 1"		HEET 10

2.1.3 Signal Conditioner Cards

Signal conditioner cards were designed that provide compatibility between the SCG and signals emanating from various avionic black boxes. The signal conditioner designs employ five basic types of conditioners in various combinations for interfacing 137 signals of the TA-7C. The signal conditioner requirements and designs are contained on drawing number 83-80358, a multi-sheet drawing.

2.1.4 Lighting Power Protection Assembly

The lighting power protection unit was designed as a self-contained subassembly. The design is contained on drawing number 83-80351.

2.1.5 SCG Output Cards

Low power output switches were designed for the simulator. The evolved designs employ five basic types of drivers. These provide drive power amplification for the demultiplex output channels for interfacing 122 TA-7C loads (functions). The evolved designs are contained on drawing number 83-80357, a multi-sheet drawing.

2.1.6 Lamp Driver Assemblies

Three types of lamp drivers were designed for powering up 265 indicators for the TA-7C. These were designed using printed circuit cards in which various combinations of the driver types are contained on cards for accommodating the TA-7C equipment areas. The design is contained on drawing number 83-80356. This drawing package will be submitted to NADC for review under separate cover from this report as being representative of system-circuit designs developed on the program.

2.1.7 Resistor-Diode Card Assembly

The resistor-diode card assembly was designed and is contained on drawing number 83-80354.

2.2 Data Listings

Four types of data listings were developed during the program which define the interface between the SCG and simulator controls and displays. These data listings are:

- (1) Terminal I/O Channel Assignments
- (2) SCG Input Signal Data
- (3) SCG Output Signal Data
- (4) SCG Processor Boolean Equations

The paragraphs which follow discuss these data listings and present samples of the data prepared. Complete listings were not formalized due to data changes anticipated during firm-up of the simulator design. Complete handwritten listings are available for review.

2.2.1 Terminal Channel Assignments

To aid in terminal channel allocation during simulator design and in system troubleshooting during simulator operation/checkout, a listing of SCG remote terminal channel assignments was prepared. This listing was prepared on computer coding forms to permit keypunch and sorting/listing options. Figure 6 is a reproduction of a sampling of the computer cards.

The terminal channel assignment listing simplifies the accounting of channel usage for the four major checkout groups used in the AAES Simulator. The simulator modular concept and the use of four checkout groups for implementing the simulator with a limited quantity of AAES ADM hardware is documented in Report No. NADC-77277-30, "AAES Simulator Requirements and Technical Services". The usage definition of each remote terminal channel for the four checkout groups consists of the signal identification code and the associated system wire interconnection diagram for each channel/group application. This list, coupled with the interconnection wire diagrams and SCG input/output signal charts, provides a good man-to-machine interface for understanding, checkout and operation of the simulator system.

The encoding format for signal identification codes and operational addresses (terminal/channel number) is discussed in the following paragraph.

2.2.2 SCG Input Signal Data

Listings were prepared which tabulate information on the various control/display interface input signals to the SCG. The information provided for each input signal defines the signal characteristics, function and point of origin and destination. A sample sheet of the Signal Source Data Charts is shown in Table 2. Tabulated in the signal source charts are the following data for each signal, reading from left to right:

- (1) Line Item - Each input signal is assigned a unique line item number. The line items are assigned in numerical sequence and provide an indexing function.
- (2) Identifier Code - Each input signal is assigned a six character alphanumeric code consisting of:
 - o The first two code letters designate the system from which the input signal originates. The simulator systems and associate two character system codes are listed in Table 3.
 - o The third letter (S) indicates that the code is associated with a signal source (i.e., an input signal to the SCG).
 - o The remaining three letters provide an alphanumeric abbreviation of the source function.

An example identification code is deciphered below:

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[illegible]

FIGURE 6. TERMINAL CHANNEL ASSIGNMENT DATA

TABLE 2
SIGNAL SOURCE DATA CHART

LINE ITEM	IDENT CODE	DESCRIPTION	GROUP CODE	ORIGIN	SOURCE TYPE	LOGIC 1 CONDITION	REF DESIGNATOR	OPERATIONAL ADDRESS	WKG DIAG	SIG CHAR CODE
0001	F2PAC	COMMAND XFER-PWD ACLS	7	PWD RH COML	PUSH BUTTON	ACLS XFER	A20625	01P05	F20	2
0002	F2PFD	COMMAND XFER-PWD RDR/SLEW	7	PWD RH COML	PUSH BUTTON	RDR XFER	A20626	01P04	F20	2
0003	F2PFI	COMMAND XFER-PWD IFF	7	PWD RH COML	PUSH BUTTON	IFF XFER	A20623	01P03	F20	2
0004	F2PTV	COMMAND XFER-PWD NAV	7	PWD RH COML	PUSH BUTTON	NAV XFER	A20622	01P02	F20	2
0005	F2PUH	COMMAND XFER-PWD UHF	7	PWD RH COML	PUSH BUTTON	UHF XFER	A20621	01P01	F20	2
0006	F2PAC	COMMAND XFER-AFT ACLS	7	AFT RH COML	PUSH BUTTON	ACLS XFER	A20925	03P05	F20	2
0007	F2PFD	COMMAND XFER-AFT RDR/SLEW	7	AFT RH COML	PUSH BUTTON	RDR XFER	A20926	03P04	F20	2
0008	F2PFI	COMMAND XFER-AFT IFF	7	AFT RH COML	PUSH BUTTON	IFF XFER	A20923	03P03	F20	2
0009	F2PTV	COMMAND XFER-AFT NAV	7	AFT RH COML	PUSH BUTTON	NAV XFER	A20922	03P02	F20	2
0010	F2PUH	COMMAND XFER-AFT UHF	7	AFT RH COML	PUSH BUTTON	UHF XFER	A20921	03P01	F20	2
0011	R2PFRQ	UHF SQUELCH CTL-PWD	4	PWD L CCL	SPOT TNG	SQUELCH ON	R2100	01P06	R01	1
0012	R2PDRQ	UHF SQUELCH CTL-AFT	4	AFT L CCL	SPOT TNG	SQUELCH ON	R2101	03P06	R01	1
0013	Q2PDRN	APC PWD ENGAGE SWITCH	2	PWD L2SL	SPOT TNG	ENGAGE ON	A22101	01P07	C3	1
0014	Q2PDRN	APC PWD ENGAGE SWITCH	2	PWD L2SL	SPOT TNG	ENGAGE OFF	A22101	01P08	C3	2
0015	Q2PDRN	APC PWD TEMP SWITCH	2	PWD L2SL	SPOT TNG	TEMP - HOT	A22102	01P09	C3	2
0016	Q2PDRN	APC PWD TEMP SWITCH	2	PWD L2SL	SPOT TNG	TEMP - COLD	A22102	01P10	C3	2
0017	Q2PDRN	APC APT ENGAGE SWITCH	2	AFT L2SL	SPOT TNG	ENGAGE ON	A20501	03P07	C3	2
0018	Q2PDRN	APC APT ENGAGE SWITCH	2	AFT L2SL	SPOT TNG	ENGAGE OFF	A20501	03P08	C3	2
0019	Q2PDRN	APC APT TEMP SWITCH	2	AFT L2SL	SPOT TNG	TEMP - HOT	A20502	03P09	C3	2
0020	Q2PDRN	APC APT TEMP SWITCH	2	AFT L2SL	SPOT TNG	TEMP - COLD	A20502	03P10	C3	2
0021	Q2PDRN	APC ACTUATOR ENGAGE	2	AFT EQUIP	SIGNAL	ACT ENGAGED	B40171-S	12P01	C3	3
0022	Q2PDRN	APC TEST-LOG OR SAFE	2	L AVION	SIGNAL	WT OFF ON	J301-3	09P01	C3	4
0023	C2PDRN	TRM SYS-PWD REEP LEFT	2	PWD C/P	SPAT PUSHER	PWD REEP LEFT	A20204	06P01	04	3
0024	C2PDRN	TRM SYS-PWD REEP UP	2	PWD C/P	SPAT PUSHER	PWD REEP UP	A20204	06P02	04	3
0025	C2PDRN	TRM SYS-PWD REEP RIGHT	2	PWD C/P	SPAT PUSHER	PWD REEP RIGHT	A20204	06P03	04	3
0026	C2PDRN	TRM SYS-PWD REEP DOWN	2	PWD C/P	SPAT PUSHER	PWD REEP DOWN	A20204	06P04	04	3
0027	C2PDRN	TRM SYS-AFT REEP LEFT	2	AFT C/P	SPAT PUSHER	AFT REEP LEFT	A20204	06P01	04	3
0028	C2PDRN	TRM SYS-AFT REEP UP	2	AFT C/P	SPAT PUSHER	AFT REEP UP	A20204	06P02	04	3
0029	C2PDRN	TRM SYS-AFT REEP RIGHT	2	AFT C/P	SPAT PUSHER	AFT REEP RIGHT	A20204	06P03	04	3
0030	C2PDRN	TRM SYS-AFT REEP DOWN	2	AFT C/P	SPAT PUSHER	AFT REEP DOWN	A20204	06P04	04	3

TABLE 3
ADDRESS SIGNATURE FUNCTION AND DESIGNATION LETTERS

AIRCRAFT SYSTEM FUNCTION LETTER	FUNCTION	AIRCRAFT SYSTEM FUNCTION LETTER	FUNCTION
A	<u>ARMAMENT:</u>	D	<u>INSTRUMENT:</u>
AA	Bomb Suspension & Release	DA	Ammeter
AB	Torpedo	DB	Oil-Flap Position
AC	Depth Charge	DC	Cowl-Flap Position
AD	Guns	DD	Coolant Flap Position
AE	Gun Heater	DE	Air Pressure
AF	Chemical	DF	Free Air Temperature
AG	Rocket	DG	Landing Gear Position
AH	Sight	DH	Hydraulic Pressure
AJ	Turret	DJ	Cabin Pressure
AK	Warning	DK	Carbon Monoxide
AL	External Pylons & Stores	DL	Landing-Flap Position
AM	Jettison Fuel Tanks	DM	Propeller Pitch Position
B	<u>PHOTOGRAPHIC:</u>	DN	Instrument Vacuum Pump
BA	Gun Camera	DP	Horizontal-Stabilizer Position
BB	Mapping Camera	DQ	Trim-Tab Position
BC	Reconnaissance Camera	DR	Water Pressure
BD	Camera Intervalometer	DS	Voltmeter
BE	Camera Doors	DT	Clock
BF	Camera Heaters	DU	Warning
BG	Warning	DV	Speed Brake Position
C	<u>CONTROL SURFACE:</u>	DW	EPP Door Position
CA	Automatic Pilot	E	<u>ENGINE INSTRUMENT:</u>
CB	Booster	EA	Carburetor Air Temperature
CC	Control Tabs	EB	Bearing Temperature
CD	Airspeed Brakes	EC	Tailpipe or Turbine Outlet Temperature
CE	Flight	ED	Carburetor Anti-Icing Fluid Quantity
CF	Horizontal Stabilizer	EE	Fuel Mixture
CG	Landing Flaps	EF	Torque Meter
CH	Water-Rudder Position	EG	Brake Mean Affective Pressure
CJ	Trim Tabs	EH	Fuel Flow
CK	Wing Flaps	EJ	Fuel Quantity
CL	Warning	EK	Fuel Capacity
		EL	Cylinder Head Temperature
		EM	Oil Temperature
		EN	Coolant Temperature
		EP	Oil Pressure
		EQ	Manifold Pressure

TABLE 3
ADDRESS SIGNATURE FUNCTION AND DESIGNATION LETTERS (Continued)

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AIRCRAFT SYSTEM FUNCTION LETTER	FUNCTION	AIRCRAFT SYSTEM FUNCTION LETTER	FUNCTION
	<u>ENGINE INSTRUMENT: (Contd)</u>		
ER	Fuel Pressure	CL	Warning
ES	Propeller Anti-Icing	GM	Weight on Gear
	Fluid Quantity	GN	Launch Bar
ET	Engine Oil Quantity		
EU	Tachometer	H	<u>HEATING, VENTILATING, AND DE-ICING:</u>
EV	Synchroscope		
EW	Warning		
EX	Turbine Outlet Pressure	HA	Anti-Icing (General)
F	<u>FLIGHT INSTRUMENT:</u>	HB	Battery Heater
FA	Bank and Turn	HC	Cabin Heater
FB	Rate of Climb	HD	Cigarette Lighter
FC	Directional Gyro	HE	De-Icing (General)
FD	Air Position	HF	Heated Flying Suits
FE	Ground Positioning	HG	Gallery
FF	Compass	HH	Windshield Defroster
FG	Gyro Position	HJ	Windshield Defogger
FH	Attitude Gyro	HK	Windshield De-Icer
FJ	Driftmeter	HL	Heater Blanket
FK	Altimeter	HM	Oil Immersion Heater
FL	Airspeed	HN	Refrigeration
FM	Accelerometer	HP	Cabin Supercharger
FN	Pitot-Static Tube Heater	HQ	Ventilation
FP	Warning	HR	Water Heater
FQ	Doppler	HS	Oxygen Heater
FR	Inertial Platform	HT	Warning
FS	Angle of Attack	HV	Rain Repellant
FT	Instrument Mode Selection	I	In order to avoid confusion with the numeral one, the letter "I" shall not be used for a function letter.
FU	Heads-Up Display		
FV	Navigation Computer		
FW	Command Transfer Control		
G	<u>LANDING GEAR, WING FOLDING:</u>	J	<u>IGNITION:</u>
GA	Actuation	JA	Booster
GB	Retraction	JB	Vibrator
GC	Wheel Brakes	JC	Distributor
GD	Down Lock	JD	Electronic
GE	Wing Folding	JE	Jet Assist Take-Off
GF	Ground Safety	JF	Magneto Ground Wiring
GG	Arresting Hook	JG	Warning
GH	Wheel Steering		
GJ	Up Lock	K	<u>ENGINE CONTROL:</u>
GK	Wheel Spinning		
		KA	Carburetor Air Flap
		KB	Blower Ratio
		KC	Cowl Flap, Air Shutter

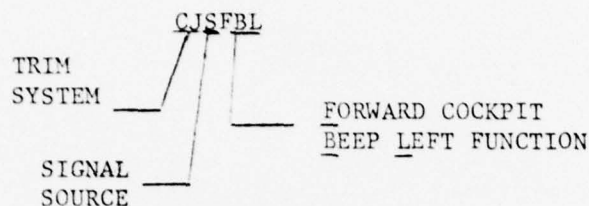
TABLE 3
ADDRESS SIGNATURE FUNCTION AND DESIGNATION LETTERS (Continued)

AIRCRAFT SYSTEM FUNCTION LETTER	FUNCTION	AIRCRAFT SYSTEM FUNCTION LETTER	THIS PAGE IS BEST QUALITY PRACTICABLE FROM COPY FURNISHED TO DDC FUNCTION
	<u>ENGINE CONTROL: (CONTD)</u>	N	<u>UNASSIGNED:</u>
KD	Intercooler Flap	O	In order to avoid confusion with the numeral zero, the letter "O" shall not be used for function letters.
KE	Oil Cooler Shutter		
KF	Propeller Feathering		
KG	Propeller Synchronizer		
KH	Propeller Pitch		
KJ	Supercharger Regulator	P	<u>DC POWER:</u>
KK	Starter	PA	Primary Power
		PB	Emergency Power
		PC	SOSTEL Control Group
		Q	<u>FUEL AND OIL:</u>
KL	Warning	QA	Fuel Valves
KM	Temperature Limiting	QB	Fuel Booster-Pump Motor
KN	Fuel Control	QC	Mixture Control
L	<u>LIGHTING:</u>	QD	Oil Dilution-Engine Primer
LA	Approach	QE	Fuel Transfer-Pump Motor and Control
LB	Flasher-Coder	QF	Fuel Loading-Pump Motor
LC	Cockpit	QG	Oil Transfer-Pump Motor and Control
LD	Drift	QH	Oil Booster-Pump
LE	Cabin	QJ	Oil Scavenger Pump
LF	Formation	QK	Throttle Control
LG	Cargo	QL	Fuel Pump Motor
LH	Interior	QM	Oil Diverter
LJ	Instrument	QN	Oil Valves
LK	Section (Fuselage)	QP	Water Injection
LL	Landing	QQ	Warning
LM	Exterior	QR	Air Refueling
LN	Running, Position, Navigation	QS	Exhaust Smoke Abatement
LP	Passing		
LQ	Search	R	<u>RADIO (NAVIGATION AND COMMUNICATION)</u>
LR	Taxi		
LS	Anchor	RA	Instrument Landing
LT	Warning	RC	Command
M	<u>MISCELLANEOUS ELECTRIC:</u>	RD	Radio Direction Finding
MA	Windshield Spray	RF	VHF Liaison
MB	Bilge Pump	RH	Homing
MC	Cargo Door	RL	Liaison
MD	Water Distillation	RM	Marker Beacon
ME	Windshield Wiper	RN	Navigation
MF	Hoist	RP	Special Systems
MG	Enclosure Operation	RS	SHF Command
MH	Positioner; Seat, Pedal	RT	Radio Teletype
MJ	Special Test Equipment	RJ	UHF Command
MK	Winches, Target Glider	RV	VHF Command
ML	R.A.T. Actuator	RX	Recorder
MM	Hydraulic Supply Control	RL	Interphone, Headphone

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TABLE 3
ADDRESS SIGNATURE FUNCTION AND DESIGNATION LETTERS (Continued)

AIRCRAFT SYSTEM FUNCTION LETTER	FUNCTION	AIRCRAFT SYSTEM FUNCTION LETTER	FUNCTION
S	<u>RADAR:</u>	W	<u>WARNING AND EMERGENCY:</u>
SA	Altimeter	WA	Enclosure Release and Lock
SF	Intercept	WB	Fire Extinguishers
SG	Gunlaying	WC	Flare Release
SM	Mapping	WD	Submersion Actuator
SN	Navigation	WE	Bailout Alarm
SO	Bombing	WF	Seat Ejector
SR	Recorder	WG	Fire Detector
SS	Search	WH	Oxygen Detector
SV	Special Systems	WJ	No Smoking Sign
SW	Warning	WK	Fasten Belts Sign
SX	Recognition (IFF)	WL	Intercrew Buzzer or Light
T	<u>SPECIAL ELECTRONIC:</u>	X	<u>AC POWER:</u>
		XA	Primary Power
		XB	Emergency Power
		Y	<u>ARMAMENT SPECIAL SYSTEMS:</u>
TA	Adapters	Y*A	Air to Air
TB	Radar Control	Y*B	Air to Surface
TC	Radio Control	Y*C	Multimode
TD	Airborne Announcing	Y*M	Missile Guidance
TE	Electronic Countermeasures	Y*T	Turret
TF	Repeat Back		
TG	GM Homing		
TH	Infrared		
TK	Telemetering		
TL	Attitude Indicator		
TM	Chaff Dispenser		
TN	Navigation		
TP	Beacon (Crash and Locator)		
TQ	Transmitters and Receivers		
TR	Receivers		
TS	Anti-Submarine (ASW)		
TT	Transmitters		
TU	Reconnaissance		
TW	Weather Devices		
TX	Television Transmitters		
TY	Television Receivers		
TZ	Bombing Devices		
U	<u>MISCELLANEOUS ELECTRONIC:</u>		
V	<u>DC POWER FOR AC SYSTEMS:</u>		
		Z	<u>UNASSIGNED:</u>



- (3) Description - A brief three to six word functional description is listed to identify each signal.
- (4) Group Code - A single character, alphanumeric code is provided to designate the simulator checkout groups in which the associated signal is utilized. The group codes are identified in Table 4.
- (5) Origin - This data column identifies the simulator area from which the signal originates.
- (6) Source Type - The signal source type is specified in this column. Typical type designations used are:

PUSH	-	Pushbutton switch
SPST	-	Two position toggle
SPDT	-	Three position toggle
ROTARY	-	Multiposition rotary switch
PUSH LTD	-	Lighted legend pushbutton switch
SIGNAL	-	Discrete signal from black box
PROX	-	Proximity sensing transducer
LIMIT	-	Position Limit switch
- (7) Logic 1 Condition - The signal source position or state which generates a logic 1 condition (420 ohms switched impedance) is identified in this column for each input signal.
- (8) Reference Designator - An alphanumeric designator (see MIL-STD-16 for format) is assigned to the component/equipment which generates the input signal. This reference designator correlates to a part number of the sourcing component. A listing of reference designators and associated part numbers is contained in the wire interconnection diagram data set.
- (9) Operational Address - A unique five character code is assigned to each SCG remote terminal channel. The first two digits identify the specific remote terminal to which the signal is routed. The third character (P) signifies either a multiplex terminal or the multiplex portion of a combined multiplex/demultiplex terminal. The remaining two digits identify the specific channel of the multiplex terminal to which the signal is routed. These channel numbers are within the range of 01 to 63.

TABLE 4
INPUT/OUTPUT DATA CHART
GROUP CODES

<u>CODE</u>	<u>CHECKOUT GROUP</u>
0	1, 2, 3 and 4
1	1
2	2
3	3
4	4
5	2 and 3
6	1, 2, and 3
7	3 and 4
8	1 and 4
9	1, 3 and 4
A	2 and 4
B	1, 2 and 4
C	2, 3 and 4

- (10) Wire Diagram - The wiring diagram sheets which show the signal source, are identified in this column. A two, three or four character suffix to the wire interconnect diagram drawing number is listed. For example, "F20" refers to drawing "83-80330-F20" where "83-80330" is the basic drawing number for the interconnection diagram set.
- (11) Signal Characteristic Code - A signal characteristics code is provided to identify the basic characteristics of the input signal. Table 5 lists the codes and associated characteristics.

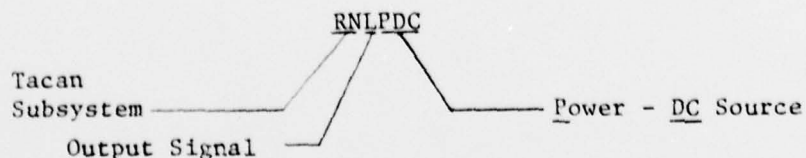
A cross-reference listing of signal identification codes to line item numbers was developed to augment locating any given signal source in the data charts. This listing is a tabulation of all identification codes in alphanumeric order. The line item associated with each identification code is adjacent to the code. Table 6 is an example of the cross-reference chart.

2.2.3 SCG Output Signal Data

A set of charts were prepared which tabulate information on the control/display output interface signals similar to that tabulated for inputs. A sample sheet of these Output Data Charts is shown in Table 7. The chart tabulates the following (reading from left to right) data for each output signal:

- (1) Line Item - Each output signal is assigned a unique line item number in numerical sequence. These numbers are used for indexing.
- (2) Identifier Code - Each output signal is assigned a unique six character alphanumeric code which identifies the output in terms of subsystem and function. The code characters are selected in a manner similar to that discussed for input signals in section 2.2.2(2). The difference is that the third character in the output identifier code is an "L" instead of the "S" used for Input signals. The "L" indicates that the code is associated with a "load" or "output".

A sample output identification code is deciphered below:



To reduce the time required to locate the output data associated with any given output signal, a cross reference list similar to that as depicted by Table 8 will be prepared for the output

TABLE 5

INPUT SIGNAL
CHARACTERISTICS CODE

CODE	CHARACTERISTIC
1	Contactless switched impedance (characteristics defined by NADC-30-TS-7603)
2	Switched impedance implemented with electromechanical contacts and discrete resistors
3	Switch closure in which continuity (impedance less than 10 ohms) indicates a logic 1 condition and an open circuit (impedance greater than 10K ohms) indicates a logic 0 state.
4	Discrete signal which indicates a logic 1 by an impedance to "airframe" ground of less than 10 ohms and which indicates a logic 0 by an impedance to "airframe" ground greater than 10K ohms
5	Discrete signal in which a voltage with respect to airframe ground of 17 volts dc or greater represents a logic 1 and a voltage of 5 volts or less represents a logic 0.
6	Discrete signal in which a logic 1 state occurs when a voltage (WRT airframe ground) of 17 volts dc or greater is present or a resistance to ground of less than 10 ohms exists.

SAMPLE OF CROSS-REFERENCE BETWEEN
IDENTIFICATION CODE AND LINE ITEM

000000	000	000000	000	000000	000
000001	001	000001	001	000001	001
000002	002	000002	002	000002	002
000003	003	000003	003	000003	003
000004	004	000004	004	000004	004
000005	005	000005	005	000005	005
000006	006	000006	006	000006	006
000007	007	000007	007	000007	007
000008	008	000008	008	000008	008
000009	009	000009	009	000009	009
000010	010	000010	010	000010	010
000011	011	000011	011	000011	011
000012	012	000012	012	000012	012
000013	013	000013	013	000013	013
000014	014	000014	014	000014	014
000015	015	000015	015	000015	015
000016	016	000016	016	000016	016
000017	017	000017	017	000017	017
000018	018	000018	018	000018	018
000019	019	000019	019	000019	019
000020	020	000020	020	000020	020
000021	021	000021	021	000021	021
000022	022	000022	022	000022	022
000023	023	000023	023	000023	023
000024	024	000024	024	000024	024
000025	025	000025	025	000025	025
000026	026	000026	026	000026	026
000027	027	000027	027	000027	027
000028	028	000028	028	000028	028
000029	029	000029	029	000029	029
000030	030	000030	030	000030	030
000031	031	000031	031	000031	031
000032	032	000032	032	000032	032
000033	033	000033	033	000033	033
000034	034	000034	034	000034	034
000035	035	000035	035	000035	035
000036	036	000036	036	000036	036
000037	037	000037	037	000037	037
000038	038	000038	038	000038	038
000039	039	000039	039	000039	039
000040	040	000040	040	000040	040
000041	041	000041	041	000041	041
000042	042	000042	042	000042	042
000043	043	000043	043	000043	043
000044	044	000044	044	000044	044
000045	045	000045	045	000045	045
000046	046	000046	046	000046	046
000047	047	000047	047	000047	047
000048	048	000048	048	000048	048
000049	049	000049	049	000049	049
000050	050	000050	050	000050	050
000051	051	000051	051	000051	051
000052	052	000052	052	000052	052
000053	053	000053	053	000053	053
000054	054	000054	054	000054	054
000055	055	000055	055	000055	055
000056	056	000056	056	000056	056
000057	057	000057	057	000057	057
000058	058	000058	058	000058	058
000059	059	000059	059	000059	059
000060	060	000060	060	000060	060
000061	061	000061	061	000061	061
000062	062	000062	062	000062	062
000063	063	000063	063	000063	063
000064	064	000064	064	000064	064
000065	065	000065	065	000065	065</

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TABLE 7
OUTPUT DATA CHART

LINE ITEM	IDENT CODE	DESCRIPTION	GROUP CODE	DESTIN LOCATION	OUTPUT DEVICE		REF DESIGNATOR	OPERATIONAL ADDRESS	WRG DIAG	BOOLEAN EQUATION	LOAD IDENT CONNECTOR P/DOUT
					TYPE	LD CURRENT					
0001	FMLFAY	CND XFR-FWD ACLS RED	7	FWD C/P LD	LAMP DRIVER	0.4 S	A2150U2	01Q02	F20	Z1006	J218A-21
0002	FMLFAG	CND XFR-FWD ACLS YEL	7	FWD C/P LD	LAMP DRIVER	0.4 S	A2150U1	01Q01	F20	Z1007	J218A-20
0003	FMLFRG	CND XFR-FWD RDR YEL	7	FWD C/P LD	LAMP DRIVER	0.4 S	A2150U3	01Q03	F20	Z1011	J218A-17
0004	FMLFRY	CND XFR-FWD RDR RED	7	FWD C/P LD	LAMP DRIVER	0.4 S	A2150U4	01Q04	F20	Z1010	J218A-18
0005	FMLFIG	CND XFR-FWD IFF YEL	7	FWD C/P LD	LAMP DRIVER	0.4 S	A2150U5	01Q05	F20	Z1015	J218A-12
0006	FMLFIY	CND XFR-FWD IFF RED	7	FWD C/P LD	LAMP DRIVER	0.4 S	A2150U6	01Q06	F20	Z1014	J218A-13
0007	FMLFRG	CND XFR-FWD NAV YEL	7	FWD C/P LD	LAMP DRIVER	0.4 S	A2150U7	01Q07	F20	Z1019	J218A-08
0008	FMLFRY	CND XFR-FWD NAV RED	7	FWD C/P LD	LAMP DRIVER	0.4 S	A1150U8	01Q08	F20	Z1018	J218A-09
0009	FMLFUG	CND XFR-FWD UHF YEL	7	FWD C/P LD	LAMP DRIVER	0.4 S	A2150U9	01Q09	F20	Z1023	J218A-05
0010	FMLFUY	CND XFR-FWD UHF RED	7	FWD C/P LD	LAMP DRIVER	0.4 S	A2150U10	01Q10	F20	Z1022	J218A-06
0011	FMLAAG	CND XFR-AFT ACL YEL	7	AFT C/P LD	LAMP DRIVER	0.4 S	A2151U1	03Q01	F20	Z1009	J218A-20
0012	FMLAAY	CND XFR-AFT ACL RED	7	AFT C/P LD	LAMP DRIVER	0.4 S	A2151U2	03Q02	F20	Z1008	J218A-21
0013	FMLARG	CND XFR-AFT RDR YEL	7	AFT C/P LD	LAMP DRIVER	0.4 S	A2151U3	03Q03	F20	Z1013	J218A-17
0014	FMLARY	CND XFR-AFT RDR RED	7	AFT C/P LD	LAMP DRIVER	0.4 S	A2151U4	03Q04	F20	Z1012	J218A-18
0015	FMLAIG	CND XFR-AFT IFF YEL	7	AFT C/P LD	LAMP DRIVER	0.4 S	A2151U5	03Q05	F20	Z1017	J218A-12
0016	FMLAIY	CND XFR-AFT IFF RED	7	AFT C/P LD	LAMP DRIVER	0.4 S	A2151U6	03Q06	F20	Z1016	J218A-13
0017	FMLAAG	CND XFR-AFT NAV YEL	7	AFT C/P LD	LAMP DRIVER	0.4 S	A2151U7	03Q07	F20	Z1021	J218A-08
0018	FMLARI	CND XFR-AFT NAV RED	7	AFT C/P LD	LAMP DRIVER	0.4 S	A2151U8	03Q08	F20	Z1020	J218A-09
0019	FMLAIL	CND XFR-AFT UHF YEL	7	AFT C/P LD	LAMP DRIVER	0.4 S	A2150U9	03Q09	F20	Z1025	J218A-05
0020	FMLAIY	CND XFR-AFT UHF RED	7	AFT C/P LD	LAMP DRIVER	0.4 S	A2151U10	03Q10	F20	Z1024	J218A-06
0021	FDLANT	ADF ANTENNA INSTR FWR	4	FWD C/P LMC	PC-26VAC	0.36 M	A2148U9	04Q49	RD1	PRI	E20811-A
0022	FDLPDC	ADF ANTENNA DC FWR	4	NAV LMC	PC-1/2 DC	0.24 M	A3007U1	11Q01	RD1	PRI	RF303P8-15
0023	FDLPFB	ADF ANTENNA HIB FWR	4	NAV LMC	PC-1/2 AC	0.24, 0.8 M	A3007U2	11Q21	RD1	PRI	RF303P8-22
0024	RLPDC	AUX RADIO RCVR DC FWR	4	NAV LMC	PC-1/2 DC	0.32 M	A3007U2	11Q02	RL1	PRI	RF303P11-M
0025	RLUDS	TACAN INSTR FWR	4	FWD C/P LMC	PC-26 VAC	0.62 M	A2148U50	04Q50	RL1	PRI	RF303P1905-S
0026	RLPDC	TACAN DC FWR	4	NAV LMC	PC-2DC	0.55 M	A3007U5	11Q05	RL1	PRI	RF303P1901-D
0027	RLPFA	TACAN PH A FWR	4	NAV LMC	PC-5AC	2.11 M	A3007U29	11Q29	RL1	PRI	RF303P1901-S
0028	RLIASL	TACAN AFT CTL SELECT	4	AFT C/P LMC	PC-1/2 DC	0.20 S	A2149U1	05Q01	RL1	Z1003	A212011-55, +
0029	RLIASL	AUX RCVR AFT CTL SELECT	4	AFT C/P LMC	PC-1/2 DC	0.30 S	A2149U2	05Q02	RL1	Z1004	A204011-53, +
0030	RLPFA	UHF COM SYS-PH A FWR	4	NAV LMC	PC-3AC	0.71, 0.8 M	A3007U23	11Q23	RL1	EMER	TF303P12-F

TABLE 8

SAMPLE OF CROSS-REFERENCE BETWEEN IDENTIFICATION CODE AND LINE ITEM.

IDENT CODE	LINE ITEM	IDENT CODE	LINE ITEM	IDENT CODE	LINE ITEM	IDENT CODE	LINE ITEM
AALAF1	413	AALMA6	400	AALTA1	342	AGLIRL	533
AALAF2	421	AALMA7	392	AALTA2	353	AGLIRS	530
AALAF3	586	AALMA8	383	AALTA3	364	AGLIRJ	369
AALAF6	588	AALMTL	460	AALTA6	404	AGLIRS	494
AALAF7	423	AALMU1	417	AALTA7	395	AGLMA4	367
AALAF8	415	AALMU2	425	AALTA8	381	AGLMA5	493
AALAMN	434	AALMU3	590	AALTOS	463	ALL9ML	220
AALASF	436	AALMU6	591	AALNE1	346	ALLBSL	219
AALASH	435	AALMU7	426	AALWE2	354	ALLDRA	374
AALAX1	411	AALMU8	418	AALWE3	365	ALLDSP	212
AALAX2	419	AALNAL	555	AALWE6	402	ALLEFZ	218
AALAX3	584	AALNAR	521	AALWE7	396	ALLFLR	213
AALAX6	585	AALNA3	522	AALWE8	387	ALLGPD	223
AALAX7	420	AALNA1	343	AALWG2	351	ALLMF2	217
AALAX8	412	AALNA2	352	AALWG3	363	ALLM43	211
AALAZA	438	AALNA3	362	AALWG6	401	ALLRKT	221
AALAZB	439	AALNA6	403	AALWG7	393	ALLSHK	215
AALAZC	440	AALNA7	394	AALWG8	377	ALLSPL	222
AALAZD	437	AALNA8	382	AALWTP	487	ALLSPR	216
AALA7A	442	AALPA1	340	AALWT1	452	ALLSDO	224
AALA7B	443	AALPA2	348	AALWT2	451	ALLTFC	372
AALA7C	444	AALPA3	359	AALWT4	450	ALLTHX	373
AALA7D	441	AGLPA4	368	AALWT8	449	ALLTNE	371
AALCRE	461	AGLPA5	495	AALW10	448	ALLTPD	370
AALCS1	453	AALPA6	397	AALW20	447	ALLTPP	376
AALCS2	454	AALPA7	389	AALW40	446	ALLWAL	214
AALCS3	455	AALPA8	378	AALW80	445	BALARM	3
AALCS6	456	AALPB1	344	AAL1LG	506	BALCMC	547
AALCS7	457	AALPB2	349	AAL1RO	504	BALCHL	531
AALCS8	458	AALPB3	360	AAL1SB	505	BALCMS	532
AALOC1	339	AALPB6	398	AAL2LG	548	BALPWR	1
AALEF1	465	AALPB7	390	AAL2RD	507	BALRMN	2
AALEF1	414	AALPB8	379	AAL2SB	508	CALACC	626
AALEF2	422	ADLPCL	535	AAL3LG	549	CALAOV	579
AALEF3	587	ADLPCS	536	AAL3RD	509	CALALT	622
AALEF6	589	AALPC1	341	AAL3SB	510	CALATO	611
AALEF7	424	AALPC2	350	AAL4LG	550	CALENG	621
AALEF8	416	AALPC3	361	AAL4RD	511	CALG1A	615
AALFZA	481	AALPC6	399	AAL4SB	512	CALG1B	616
AALFZB	482	AALPC7	391	AAL5LG	551	CALG1C	617
AALFZC	483	AALPC8	380	AAL5RD	513	CALG2A	618
AALFZO	484	AALPRS	480	AAL5SB	514	CALG2B	619
AALGNS	459	AALQY1	467	AAL6LG	552	CALG2C	620
AALGUL	486	AALQY2	466	AAL6RD	515	CALHNG	600
AALGUP	596	AALQY4	465	AAL6SB	516	CALLDG	26
AALIH1	475	AALQY8	464	AAL7LG	553	CALMON	625
AALIH2	474	AALQ10	471	AAL7RD	517	CALNCL	601
AALIH4	473	AALQ20	470	AAL7SB	518	CALNPQ	602
AALIH8	472	AALQ40	469	AAL8LG	554	CALPAD	578
AALIT1	479	AALQ80	468	AAL8RD	519	CALPCC	614
AALIT2	478	AALRTD	462	AAL8SB	520	CALPCL	603
AALIT4	477	AALRTL	558	ADLCLR	432	CALPOC	608
AALIT8	476	AALRTR	560	ADLGAS	430	CALPPQ	604
AALJSF	597	AALRTS	559	ADLGFY	433	CALRAD	577
AALJTP	503	AALSAO	500	ADLGHL	529	CALRAT	623
AALMA8	526	AALSHM	498	ADLGHR	530	CALRCC	613
ADLMA1	130	AALSHO	497	ADLGLL	527	CALRCT	605
AALMAL	557	AALSHR	496	ADLGLR	528	CALROC	609
AALMAR	525	AALSID	499	ADLGPF	429	CALSFT	624
AALMA1	355	AALSRO	501	ADLGRV	428	CALSTB	606
AALMA2	347	AALST1	345	ADLHYO	431	CALTEB	610
AALMA3	358	AALST8	384	AGLDC4	366	CALTRM	27
		AALSUP	502	AGLDC5	492	CALYAW	598
		AALTAL	556	AGLFEN	656	CALYCC	612
		AALTAR	523	AGLFR4	427	CALYDC	607
		AALTAS	524	AGLFR5	491	COLAOV	6

signals. This cross-reference correlates the line item numbers to a list of identification codes arranged in alphabetical order.

- (3) Description - This item consists of a three to six word functional description of each output signal to aid in identifying each output.
- (4) Group Code - A single alphanumeric character code is used to identify the specific simulator checkout groups in which the output signal is operational. Table 4 identifies the group codes used.
- (5) Destination Location - This column of the data chart identifies the simulator location in which the power switching device is located. The locations are typically either a load management center (LMC) or a lamp driver assembly (LD). Abbreviations used in this column are:

FWD C/P	Forward Cockpit
AFT C/P	Aft Cockpit
RAV	Right Avionics Compartment
LAV	Left Avionics Compartment
AFT LMC	Aft Equipment Shelf LMC

- (6) Output Device Type - This column identifies the type of power switching device into which the output signal from the SCG demultiplex terminal is routed. Nomenclature used is identified in Table 9.
- (7) Output Device Load Current - This column identifies the current required by the associated load with the output device turned-on. The current is listed in amperes except for values listed with an "M" suffix which refers to milliamperes ratings. A single letter code at the far right of the column identifies the source of the load current data. The following codes used are:

S	-	Specification maximum
M	-	Measured value
E	-	Estimated value
V	-	Vendor supplied value
C	-	Calculated value from vendor or measured data

- (8) Reference Designator - This column lists the reference designator of the output device, i.e., the load controller, lamp driver, etc.
- (9) Operational Address - A unique five character code is assigned to each output signal. This operational address identifies the specific SCG demultiplex terminal and channel from which the output signal originates.

The operational address format is the same as that described for input signals in section 2.2.2(9). The only difference is that

TABLE 9
OUTPUT DEVICE TYPE NOMENCLATURE

ABBREVIATED NOMENCLATURE	DESCRIPTION
LAMP DRIVER	Solid state low level power switch for driving 6 and 28 volt miniature lamps.
PC-26VAC	Power controller, 26 VAC, 1 ampere (p/n TS-7602/05-001)
PC- $\frac{1}{2}$ DC	Power controller, 28 VDC, $\frac{1}{2}$ ampere (p/n TS7602/01-001)
PC-2DC	Power controller, 28 VDC, 2 ampere (p/n TS7602/01-002)
PC-5DC	Power controller, 28 VDC, 5 ampere (p/n TS7602/01-003)
PC-10DC	Power controller, 28 VDC, 10 ampere (p/n TS7602/01-004)
PC- $\frac{1}{2}$ AC	Power controller, 115 VAC, $\frac{1}{2}$ ampere (p/n TS7602/03-001)
PC-2AC	Power controller, 115 VAC, 2 ampere (p/n TS7602/03-002)
PC-5AC	Power controller, 115 VAC, 5 ampere (p/n TS7602/03-003)
GS-3	Solid state low level power switch for driving the ground leg of a load (28 volts dc, 250 ma)
GS-4	Solid state low level power switch for driving the ground leg of a load (28 volts dc @ 2.5 amp)
PS-3 or PS-3DC	Solid state low level power switch for driving the power leg of a load (28 vdc, 400 ma)
PS-2	Solid state, low level power switch for TTL interface to black boxes (6 volts dc at 100 ma)
SSR	Solid state low power level SPDT switch for TTL interface to black boxes (28 VDC at 100 ma)
SW Z INTER	Direct interface from SCG demultiplex terminal to black box. Interface is the switched impedance, 10 ma source standard
KPS-1	Ten ampere electromechanical relay with solid state relay driver for SCG compatibility.

the third character in the address is a "Q" instead of "P". The "Q" designates a demultiplexer terminal or the demultiplexer half of a multiplexer/demultiplexer terminal.

- (10) Wire Diagram - The wire interconnection diagram sheet on which the output appears is identified in this column. A two to four character code is used to identify the suffix to the 83-80330 basic drawing number. This suffix refers to a specific system diagram of a wire interconnect diagram set.
- (11) Boolean Equation - A five character code (letter "Z" followed by four digits) listed in this column for identifying the specific Boolean equation applicable to the associated output signal. A separate list is compiled for the complete set of Boolean equations. In some cases, the words "EMER", "PRI" or "SEC" are printed in this column. These words indicated that the associated output is always "on" unless disabled by the load management system. The three different words identify three gross levels of power priorities in order of decreasing priority.
- (12) Load Identification (Connector/Pin-Out) - This column lists the reference designator and connector contact number for the load connection. For example, E208J1-A specifies that the electrical load connection is at contact number A of recepticle J1 located on the WRA designated E108 (AS909/ARA48 communications antenna). The WRA reference designators are defined in data supplements to the simulator wire interconnection diagrams.
- (13) Notes - The final column is available for notes or comments on the specific output signal.

2.2.4 SCG Processor Boolean Equations

Boolean equations were developed defining the Controls and Displays SCG interface on the AAES Simulator. A Boolean equation was developed for each output signal listed in the Output Data Chart discussed above. These equations were written in terms of the input signal identification codes discussed in section 2.2.2. The equation format used is that which was developed and documented in Report No. NADC-77277-30. These equations will be converted to the "updated Garrett Powertran" format as part of the AAES Simulator Development Contract. The revised equations will be used as the base for developing a keypunched card deck which will in turn be used to generate data listings of the output equations. A set of punched cards will be delivered to NADC for use in "Powertran Compiling" at NADC.

These equations, along with the terminal I/O channel assignment data discussed in section 2.2.1 and the load management modifiers form the complete input data set needed for producing the compiled Powertran programs for loading in the SCG processors.